North Carolina
Government Business Intelligence
Competency Center
Program

October 2012

North Carolina
Office of the State Controller

David McCoy, State Controller

Table of Contents

Executive Summary 2

Government Business Intelligence Competency Center 6
I. Background 6
II. Requirements of the GBICC Initiative 8
III. Phase I Approach 9
IV. Phase I Results 12
V. Needs Assessment 23
VI. Recommendations and Next steps 30
VII. Funding and Expenditures 33

NC Financial Accountability and Compliance Technology Systems (NC FACTS) 35
I. Summary 35
II. Program Requirements 36
III. Program Activities 36
IV. Challenges 43
V. Budget 48
VI. Next steps 49

Criminal Justice Law Enforcement Automated Data Services (CJLEADS) 51
I. Background 51
II. Statewide Operations 53
On-boarding and Training 53
Usage 53
Feedback 54
III. Application Releases 55
IV. Application Enhancement 56
V. Database Upgrade 58
VI. Challenges 59
VII. Next Steps 62

VIII. Appendix 63

Executive Summary

Business Intelligence is a process that allows an organization to gather, analyze and report key information to improve business outcomes. BI focuses not only on the business process, but also on integral components that impact the business process including customers, employees, and businesses. Integrated, useful and accessible data about these key elements help an organization make effective, efficient and informed business decisions.

In Session Law 2007-323, HB 1473, the North Carolina General Assembly directed the Office of the State Controller (OSC) to develop a strategic plan for the integration of databases and sharing of information among State agencies and programs. Since 2008, OSC has managed the Statewide Data Integration Program, including the design, development and statewide implementation of Criminal Justice Law Enforcement Automated Data Services (CJLEADS) criminal justice data integration program, and in 2011, initiated efforts the development of an enterprise process to detect fraud, waste and improper payments across State agencies. Session Law 2012-142, HB 950, expands the authority of the data integration and business intelligence initiative and provides statutory language promoting greater data sharing for statewide enterprise initiatives and created the OSC Government Business Intelligence Competency Center (GBICC).

Enterprise business intelligence for North Carolina government-wide operations is a significant undertaking with unique and dynamic challenges. North Carolina meets the needs of its citizens through the combined efforts of the three branches of State government. The Executive branch, with cabinet agencies, independent offices, university, component units, and over 322,091 employees, provides a broad range of services to its citizens. These services range from K-12 public education; higher education; health and human services; economic development; environment and natural resources, public safety; transportation; agriculture; and general government services. The Legislative Branch, consisting of the 170 members of the General Assembly, enacts laws, raises revenue, and establishes rules and regulations governing the conduct of our citizens. It is supported by administrative support units with 499 FTE. The Judicial Branch, comprised of the Appellate, Superior, and District courts, employs 6,420 judges, district attorneys, clerks of court, magistrates and other court support and administrative personnel, and manages over 3.4 million civil and criminal cases annually.

North Carolina's government has been challenged with the impact of population growth during the last ten years. This growth has resulted in increased enrollment in our public schools, universities, and community colleges, greater health and social service needs, expanded public safety services including offender incarceration and supervision, and higher demand for other state infrastructure and resources. As these needs have grown, the State's resources to meet these needs have not grown at a corresponding pace. The State must continually find ways to serve its citizens through greater operational efficiencies and program effectiveness.

The 2012 Legislative Research Commission (LRC) report on Efficiencies in State Government defined business intelligence as involving *"the integrated use of computer technology, statistics, and operational research which can be used to improve efficiency and to measure performance across State government. Among the goals of its user are to align outcomes with program or service goals and to provide broad-based access to consistent information, thereby increasing*

transparency and accountability in government."[11] Total Information Technology (IT) expenditures (excluding the Office of Information Technology Services (ITS)) were $1,283,114,224 for fiscal year 2012. Of this amount, $725,879,486 was funded with General Fund resouces. IT Expenditures for ITS totaled $161,354,169 during the same period. The public and other State government stakeholders have an expectation that services, including technology based services, will be delivered efficiently and effectively. An impediment to satisfying this expectation is the State's historical and on-going management of data in silos, limiting the consistency, quality and ability to share the State's data for key decision making. In the past, comprehensive enterprise BI strategy has not been designed and implemented, in part, because of the varying levels of importance allotted to this activity by the General Assembly, the State CIO, and State agencies. Without a commitment to an enterprise approach and a strategic plan to guide the agencies, many agencies filled this void by developing programs and processes to meet their own unique operational needs without consideration of the possible future integration or enterprise use to "their" data. North Carolina's experience mirrors other states across the country that have built multiple data systems to meet specific business needs and must now determine how to consolidate and integrate data for enterprise purposes.

The vision for the North Carolina BI initiative is to transform existing data into an information utility for the State's policy and operational leaders to determine program investment, manage resources, and improved financial programs, budgets, and results. While technology plays a key role in effective BI, the successful development of statewide analytics depends upon State stakeholders who must be "on board", supportive and engaged, demonstrating their belief that enterprise BI will provide a sufficient return on investment in either dollars saved or that outcomes achieved will outweigh the cost of such projects. Strong communications and the ability to manage change and make the initiative relevant to the stakeholders requires significant effort to ensure the advantages of the program make clear "what's in it for them" to the agencies and end users.

The LRC report recommended a "phase approach towards expanding the State's business intelligence capabilities in a manner that creates efficiencies while preserving privacy and transparency." Consistent with our past data integration efforts which have been "scoped to success", the GBICC initiative will follow the principle of beginning with a targeted focus and incrementally expanding the scope of applications as expertise and capacity grows. Currently the GIBCC is engaged in three areas of analysis, development, and support:

- Phase I of the GBICC initiative including a statewide data analytics inventory effort
- The North Carolina Financial Analysis and Compliance Technology System (NC FACTS) automated enterprise fraud, waste and improper payments detection project
- The Criminal Justice Law Enforcement Automated Data Services (CJLEADS) integrated criminal justice application

Phase I of the GBICC initiative focuses on the comprehensive understanding of the State's current state of BI. Phase I includes an inventory of existing data analysis processes, development of a plan of action for the implementation of an enterprise BI program, an inventory of State agency data needs, and a determination of whether current applications can support

[1] LRC Report page 13

enterprise efforts. This report summarizes inventory survey responses from 60 different State agencies, Universities and organizations and provides insight into the current state of data analytics in North Carolina Government.

In evaluating the survey responses, the GBICC team found that many agencies leverage data from transaction systems for basic reporting and analysis. Fewer organizations reported examples of integration of data from multiple agencies and the use of advanced analytic tools. When asked about the challenges to enterprise data sharing, respondents reported a variety of issues including legal, regulatory, and privacy considerations that impede data sharing, lack of awareness of available data sources, and lack of data quality, consistency, and availability. When asked about the vision for enterprise analytics, however, respondents indicated the successful enterprise would enable:

- Improved efficiency in service delivery and management of state programs
- Better use of data
- Increased transparency
- Fewer points of entry for data discovery

Based on the inventory analysis, considerable work remains to develop a comprehensive action plan. Once authorized, the GBICC will work on key areas of program management to facilitate improved data sharing and analytics including:

- Building consensus and agency "buy-in" for the emerging GBICC initiative to ensure that efforts are focused on appropriate priorities and adding value to the agencies
- Establishing working groups of business stakeholders
- Establishing a registry of available data for use by all State organizations
- Establishing governance policies, procedures, and guidelines to broker data sharing agreements including the creation of a legal advisory group of subject matter experts on state and federal privacy, disclosure and security regulations
- Establishing data and metadata standards based on national standards and industry best practices and determine how enterprise data model management and standards will be implemented

The GBICC will also undertake a more in-depth analysis of areas of focus identified in the inventory survey. This analysis will allow the GBICC to develop potential project and priority recommendations for the GBICC Plan of Action. Top areas for further research include:

- Master database of persons receiving state services
- Master database of organizations doing business with the state
- Integrated education and workforce data
- Financial data repository
- Employee misclassification

The **Government Business Intelligence Competency Center** section of this document provides more detailed information regarding the GBICC Inventory effort and next steps.

NC FACTS continues efforts to develop automated fraud, waste and improper payment detection capabilities. While data sharing and agency commitment continue as significant

challenges, NC FACTS is making progress towards gaining access to key data sources and is currently receiving the Department of the Secretary of State corporation data, Social Security Administration death master index, OSC BEACON human resource/payroll data and NC Accounting System vendor payment data, CJLEADS incarceration and probation data, and most recently Department of Commerce - Division of Employment Security (DES) employer tax compliance data. Additional data from DES providing benefit payment is expected in the next few weeks. This information is being cleansed, loaded and analyzed in the NC FACTS technical environment.

With the recent execution of a data sharing agreement with the Department of State Treasurer (DST) – State Health Plan of North Carolina, health plan member eligibility and claim data will soon be added. Work continues on data sharing agreements with the DST – Retirement System, Administrative Office of the Courts, NC Department of Justice, NC Division of Motor Vehicles (DMV) and Department of Health and Human Services for additional data sources. This data will serve as the foundation for the pilot fraud detection efforts.

The **NC Financial Accountability and Compliance Technology System (NC FACTS)** section of this document provides detailed information about its development activities.

CJLEADS continues application support and enhancement activities to provide criminal justice professionals with access to comprehensive offender information. More than 24,000 users have been trained and are using CJLEADS statewide. CJLEADS released a mobile version of the application in late July, 2012, to allow users to access information on smart phones and tablets. In September, Release 7 provided group watchlist capability and enhanced the Concealed Handgun Violations report. Enhancements in future releases included real-time access to the Statewide Warrants Repository, NC DMV partial plate searches, confidential tag alerts, and access to federal information through an interface with the NC Department of Justice's Division of Criminal Information network.

The **Criminal Justice Law Enforcement Automated Data Services (CJLEADS)** section of this document provides detailed information about CJLEADS application support and enhancement activity.

Government Business Intelligence Competency Center

I. Background

Legislation

Business data is a valuable resource for organizations in government and the private sector. Data enables organizations to analyze historical behavior, predict future trends and make decisions based on business facts rather than intuition and supposition. Over the years, however, data has been gathered and stored in siloed data systems that were built to meet the business needs of individual organizations. When data is stored in varying formats and technical platforms, the process of gathering information from different lines of business can be complicated, time consuming and difficult.

In Session Law 2007-323, HB 1473, the North Carolina General Assembly recognized this challenge and directed the Office of the State Controller (OSC) to develop a strategic plan for the integration of databases and sharing of information among State agencies and programs. Since 2008, OSC has managed the Statewide Data Integration Program, including the design, development and statewide implementation of Criminal Justice Law Enforcement Automated Data Services (CJLEADS) criminal justice data integration program.

Session Law 2011-145, HB 200 provided further direction for OSC to expand the data integration program by developing an enterprise process to detect fraud, waste and improper payments across State agencies. This effort fosters collaboration and partnerships among State agencies with an interest in leveraging integrated data to detect incidents of fraudulent, wasteful or improper payments in their business areas. While progress has been made, significant legal and management challenges to data sharing inhibited major development during the past year.

Session Law 2012-142, HB 950, expands the authority of the data integration and business intelligence initiative and provides statutory language promoting greater data sharing for statewide enterprise initiatives and created the new OSC Government Business Intelligence Competency Center (GBICC). The GBICC will manage CJLEADS and NC FACTS, and will include a comprehensive evaluation of existing data analytics projects and plans in order to identify data integration and business intelligence opportunities that will generate greater efficiencies in, and improved service delivery by, State agencies. This effort includes all State agencies, departments, and institutions in the three branches of government.

Copies of the enabling legislation can be found in Appendix A.

What is Business Intelligence?

Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data that help users make better business decisions. BI applications, often called decision support systems, include the activities of data mining, query and reporting, online analytical processing (OLAP), and statistical and predictive analysis.

Successful BI provides the information needed to make informed decisions and take action based on information rather than intuition or belief. The ability to effectively provide information depends on understanding agency and enterprise business needs, functions, and goals and providing quality, consistent data to support those needs. As a result, business owners are integral stakeholders in driving involvement and support of data analysis and BI processes.

BI should align people, processes, technology and business culture to achieve:

- Better collaboration between Business and IT.
- Better data quality and reporting.
- Increased use of data analytics in the organization.
- Elimination of redundant functions, data and processes.
- Quality customer support and service.
- Oversight, transparency, and accountability.
- Response to procedural mandates.

Data analytics and BI can be developed at the micro level to support specific agency business needs. Enterprise BI, however, fosters collaboration between business entities, sharing of key sources of data for use across lines of business, and use of standard data formats, technologies and processes to ensure consistency and efficiency in sharing, analyzing and reporting information.

GBICC Vision Statement

The GBICC will foster interagency collaboration among and between the branches of governments and their sub-units to establish statewide standards for BI initiatives and to improve data quality and consistency. It will facilitate identification of enterprise technologies and tool-sets, seek to improve efficiency and effectiveness in enterprise BI efforts, and help prioritize BI project implementation.

The role of GBICC for the state's BI initiative should be to:

- Research current BI efforts and identify BI needs.
- Manage data governance to resolve inhibitors to and facilitate interagency data sharing.

- Recommend an enterprise BI strategic plan with priorities to ensure BI projects support enterprise efforts.
- Facilitate implementation of solutions to BI needs, according to the strategic plan.
- Establish standards for data and tools that foster interagency sharing and data consistency.
- Conduct and/or foster continuing research on BI alternatives for better decision-making

II. Requirements of the GBICC Initiative

The GBICC, as directed by Session Law 2012-142, HB 950, shall:

- Continue and coordinate on-going enterprise data integration efforts, i.e., CJLEADS and NCFACTS.
- Identify technologies currently used in North Carolina that have the capability to support the initiative.
- Identify other technologies, especially those with unique capabilities, that could support the State's BI effort.
- Compare capabilities and costs across State agencies.
- Ensure that implementation is properly supported across State agencies.
- Ensure that data integration and sharing is performed in a manner that preserves data privacy and security in transferring, storing, and accessing data as appropriate.
- Immediately seek any waivers and enter into any written agreements that may be required by State or federal law to effectuate data sharing and to carry out the purposes of this section.
- Coordinate data requirements and usage for State BI applications in a manner that limits impact on participating State agencies as those agencies provide data and business knowledge expertise, and assists in defining business rules so the data can be used properly.
- Recommend the most cost-effective and reliable long-term hosting solution for enterprise-level State BI as well as data integration.

Phase I of the GBICC initiative was directed to begin no later than August 1, 2012. The initial phase of the initiative includes:

- An inventory of existing State agencies and BI projects both completed and under development.t
- A plan of action that does the following;
    - Defines program requirements, objectives, and end-state of the initiative.
    - Prioritizes projects and stages of implementation in a detailed plan and bench-marked timeline.
    - Includes the effective coordination of all of the State's current data integration initiatives.

    - Utilizes a common approach that establishes standards for BI for all State agencies and prevents the development of projects that do not meet the established standards.
    - Determines costs associated with the development effort and identifies potential sources of funding.
    - Includes a privacy framework for BI consisting of adequate access controls and end user security requirements.
    - Estimates expected savings.
- An inventory of existing external data sources that are purchased by State agencies to determine whether consolidation of licenses is appropriate for the enterprise.
- A determination of whether current, on-going projects support the enterprise-level objectives.
- A determination of whether current applications are scalable, or are application for multiple State agencies or both.

Phase II of the GBICC initiative includes:

- Identification of redundancies and determine which projects should be discontinued.
- Determination of where gaps exist in current or potential capabilities.

Phase III of the GBICC initiative includes:

- Incorporation or consolidation of existing projects, as appropriate.
- Elimination of redundant BI projects, applications, software, and licensing.
- Implementation of steps necessary to ensure data integration is developed in a manner that adequately protects privacy.

This report will provide a summary of the Phase I activities undertaken to date.

III. Phase I Approach

The Phase I inventory exercise focused on gathering information from state agencies, organizations and universities to gain an understanding about data analytic processes currently in operations or in development through North Carolina state government. With the report deadline of October 1, 2012, the timeframe allowed to develop a data analytics survey, request information from the agencies and allow them time to respond, evaluate their responses, and summarize and report conclusions was aggressive.

Resources

The State Controller established a team to conduct the GBICC data analytics inventory effort and included three key resources from the BEACON and CJLEADS teams who were temporarily re-deployed to assist with the inventory and analysis effort. In addition, three retired state employees from the Office of the State Controller (OSC) and the Office of State Budget and Management (OSBM) joined the team on a part-time basis to assist

with the inventory effort. By August 1, 2012, this team was in place and began the task of defining the inventory survey for the agencies.

Communications

With a very tight timeframe, communications with the agencies was critical. An introductory letter from the State Controller was sent to the executives in the agencies on July 17, 2012. This letter provided the statutory language and definition of the GBICC and requested that each agency provide contact information of the individual who would act as the agency's Point of Contact (POC) in completing the Phase I inventory. The GBICC team compiled a registry of agency POCs in preparation for the distribution of the inventory survey.

On August 9, 2012, the GBICC survey was distributed to agency POCs and was accompanied by a set of Frequently Asked Questions to address anticipated questions associated with the survey. Agencies were asked to provide responses to the surveys by September 4, 2012.

To assist agencies in completing the survey, webinars were conducted on August 15 and 16 and questions were answered and concerns were address as they were raised by the participating organizations. In addition, a GBICC Hotline was established to answer individual agency questions and assist in completing the survey. During the webinars and phone calls to the Hotline, additional organizations were identified for inclusion in the effort and surveys were sent to those organizations. While the agencies were completing the surveys, the GBICC team was available to provide instruction, guidance and respond to questions as needed to facilitate the completion of the surveys.

A number of agencies expressed concern about the additional burden on their existing resources and about the aggressive timeframe for responding. While some agencies were unable to provide comprehensive information, most organizations appear to have taken a thoughtful and thorough approach to responding to the survey.

Inventory Survey

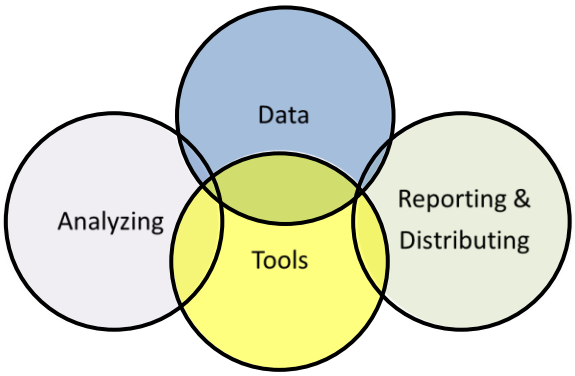
To achieve the desired survey outcomes, it was important to have well defined objectives for information gathering, and to recognize the challenge of developing questions that will provide information that can be understood, evaluated and summarized. The GBICC team, taking into account the statutory requirements for the inventory effort, designed a survey questionnaire to gather responses concerning general agency information, needs, successes, and data sharing experiences, as well as detailed information about agency data analytic processes.

A set of guidelines was provided to assist agencies in responding to the survey questions. Recognizing that agencies have varying definitions or concepts of data analytics and/or BI, the team established a common frame of reference and provided the following as the standard definition of a data analysis process:

For the purpose of this questionnaire, "data analysis processes" include any analysis and reporting of information to support business decision making. Thus, respondents should inventory each data analysis process that produces information for the purpose of:

- *Analyzing data for state business purposes and/or*
- *Distributing or sharing data with other government or private entities or individuals (free or for a fee), including publishing reports in any media, in support of business decision making.*

The components of a data analysis process would include the following:



IV. Phase I Results

Agency Responses

The GBICC inventory effort included all State agencies, departments, and institutions, including The University of North Carolina. Several larger agencies chose to survey divisions independently and/or requested that separate surveys be sent to some of their auxiliary units. In total, surveys were distributed to 62 agencies, universities, commissions, and boards. Appendix B provides a complete listing of surveys distributed and received.

For a complete inventory of survey responses, please contact the GBICC at osc.gbicc@osc.nc.gov.

Ninety-five percent of survey organizations responded to the survey. In the **60** surveys received, **659** data analytical processes were identified.

	Count	% of Surveys Requested
Surveys Requested	**62**	
Responses Received	**60**	**97%**
Response Pending	**1**	
Failure to Respond	**1**	

One agency has additional survey information forthcoming:

- UNC Hospitals – after the initial survey distribution, UNC Hospitals was identified as a separate reporting unit from the University System. UNC Hospitals has submitted a preliminary response and will provide additional information to be analyzed and incorporated into the inventory effort.

One agency failed to provide any response:

- The NC Education Assistance Authority (did not return a survey).

The agencies that returned a survey with no information but an explanation included:

- The Office of Lieutenant Governor which responded that it managed no data analysis process.
- The North Carolina Housing Finance Authority which stated that they are usually not included in these requests and receive no funds from the State for its operations.

The Department of Public Safety provided general information but no detailed process information, explaining that due to limited resources they were unable, in the timeframe allowed, to provide a complete response.

Most organizations provided thorough and detailed survey responses. While one of the main goals of GBICC in developing the survey questions was to capture consistent information, the specificity and consistency of responses varied widely for some of the key questions. The GBICC has spent significant time reviewing, analyzing and summarizing the responses to provide conclusions for this report.

Appendix C and Appendix D include the survey questions and response rates.

While the survey responses detailed 659 different data analysis processes, most of these involved transaction system functions such as financial management and budgeting, education, site, facility and property management, permitting, licensing, inspections, registration, natural resource management, regulations, and compliance, incident and case management, procurement, billing, and vendor management, human resources, customer relationship management, among others. **Although some of these processes involved data analysis components, many processes serve primarily to compile and store information and provide basic reporting capabilities. Few systems reported significant data integration or advanced analytical processing.**

Survey General Information Summary

The General Information portion of the survey requested information about the agencies' efforts with data analysis to support their organization's business processes.

As a whole, agencies provided detailed information about their use of data analysis processes, their needs for additional information in making business decisions, their perceptions of how increased enterprise BI might help their agency and the state, problems they have encountered with data sharing, and successes they have had in data analytic efforts. Responses to a vision for enterprise BI tended to reflect an agency-focused response, rather than an enterprise approach. The following significant information was compiled from responses to the General Information portion of the survey.

Data Needs

The survey asked about sources and types of data needed to improve the agency's reporting and decision making processes.

The responding agencies indicated a significant need to obtain data from non-state sources. Data from the Department of Revenue was listed as important information by a number of the responding organizations. Division of Employment Security, Department

of Transportation, and Office of the State Controller were also identified as potential providers of key information.

Top Six Sources of "Agency Needed" Data	Percentage Of Responses
Non-State (outside source)*	**15%**
Department of Revenue	**11%**
Division of Employment Security	**9%**
Department of Transportation	**8%**
Office of the State Controller	**8%**
All state agencies **	**8%**

* Non-State (outside source) includes local government agencies and vendors.
** A number of respondents indicated that they need data from all State agencies to support their analysis needs.

Examples of the types of information identified as beneficial in support of enterprise analytics included:

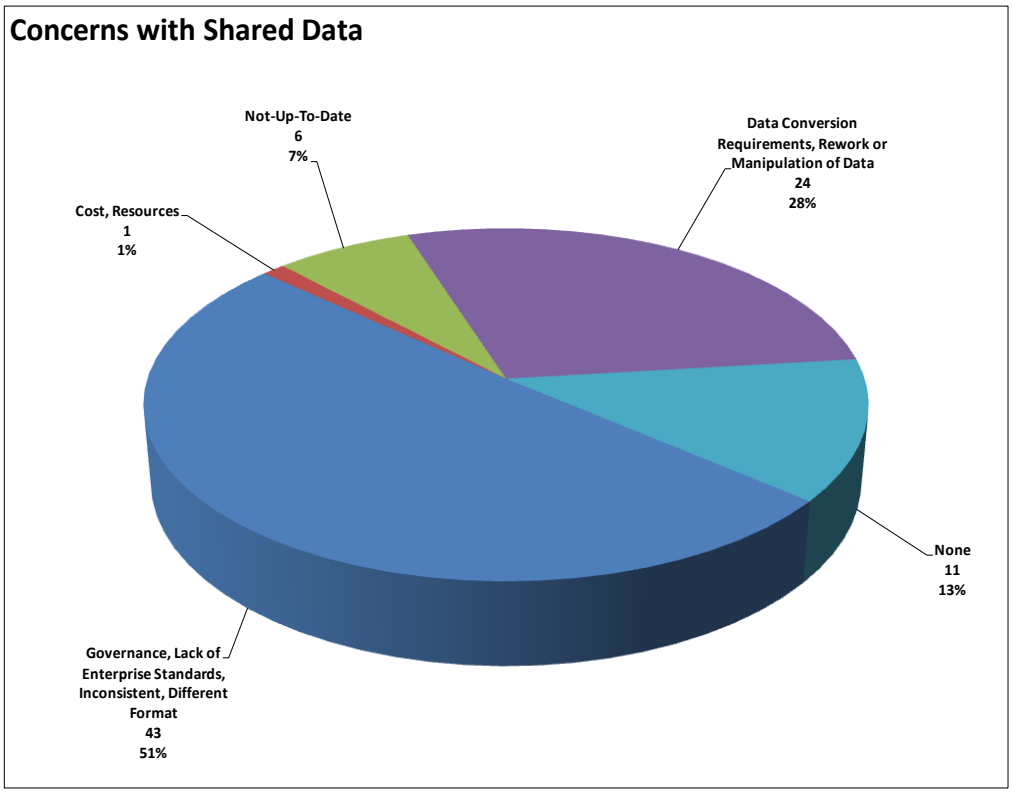
- Home address information
- Quarterly employment data
- Hiring information
- Employment and income records
- Driver's license information and history
- State services for an individual
- Information about companies/employers in the state
- Statewide payments information
- Tax parcel information
- Update of state's master address file at Center for Geographic Information and Analysis
- Travel demand data
- Demographic change information – names, addresses, births, deaths, etc.

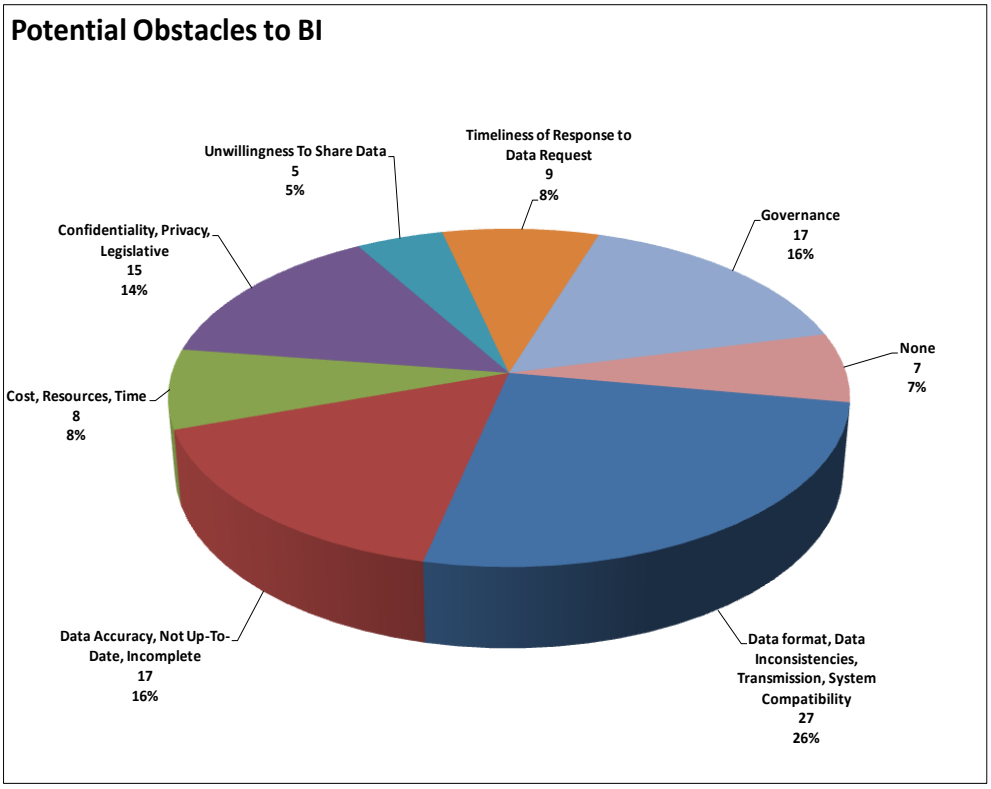
Appendix E provides a full list of the types of data identified as needed by the agencies.

Challenges with Data Integration and Analytics

Data processes provided by the agencies indicate a clear utilization of the information they gather and store to make business decisions. The majority of the systems reported, however, appear to be transaction systems with accompanying query and reporting capability. The responses reported few application efforts to integrate data from multiple sources and use advanced analytics. Most data analysis is performed to meet a specific reporting need, sometimes through manual processes, and often with Microsoft Office's Excel or Access tools. Most agencies reported that they use transaction systems to track and manage specific aspects of internal programs components such as financial or account analysis and budgeting, accounts payable and receivable, incident/ticket tracking, billing and contract management systems, as well as case management. These reported transaction systems appear to be specific to the individual agency needs and mission.

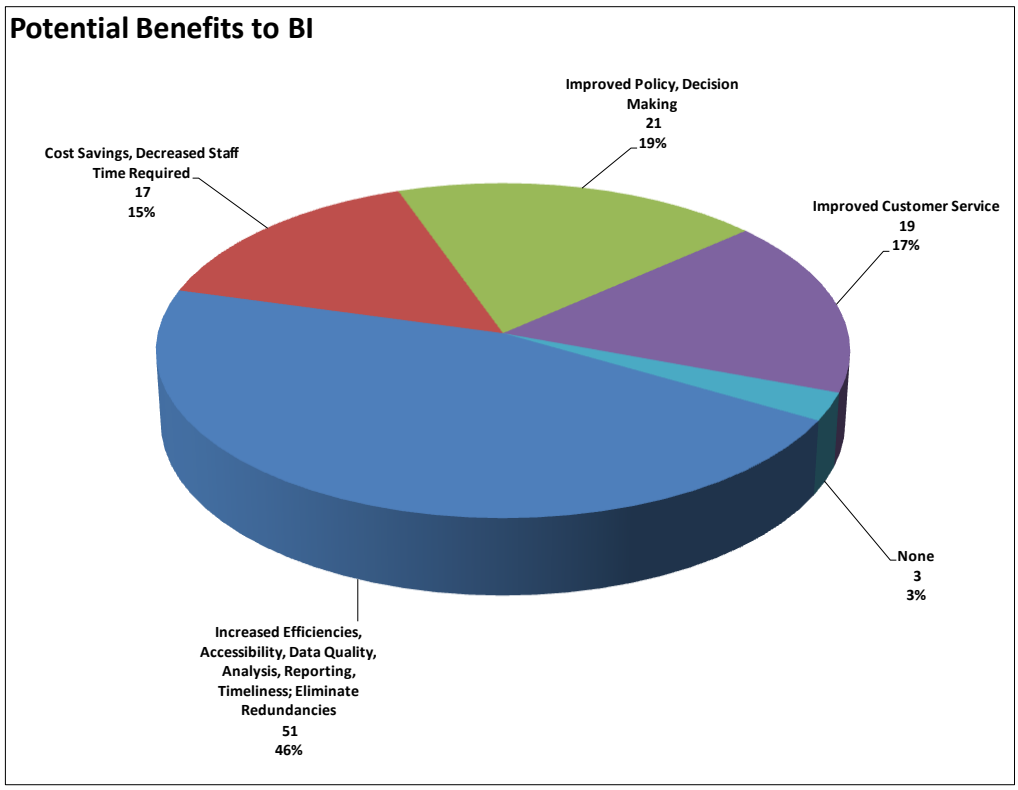
Survey responses noted a variety of challenges associated with sharing data including governance, standardization, confidentiality and legal requirements. In addition, conversion and manipulation of shared data before it can be used consume valuable time and resources. The charts below reflect survey responses addressing concerns about shared data and the potential obstacles to BI. Survey responses were analyzed and categorized according to similar subject matter using the categories in each chart. If more than one subject applied, multiple subjects were assigned as appropriate:





Benefits of Data Integration and Analytics

The chart below reflects survey responses addressing the benefits of BI. Forty-six percent of survey responses indicated increased efficiency, data accessibility, and data quality will result from a standardized BI initiative. The chart below indicates benefits noted in the survey responses. Survey responses were evaluated and categorized according to similar subject matter using the categories in the chart. If more than one subject applied, multiple subjects were ascribed as appropriate:



Reported Success in Data Integration and Analytics

Many respondents identified successes in data sharing and business analysis within their own organization, but relatively few respondents identified success initiatives focused on cross agency data sharing or demonstrated efforts that can support statewide enterprise program objectives. The following are examples of enterprise efforts involving cross agency data sharing efforts:

Free and Reduced School Lunch - The Department of Health and Human Services and the Department of Public Instruction collaborated to develop the Free and Reduced School Lunch program to share data to coordinate and automatically enroll children who are eligible to receive services through this program.

CJLEADS - CJLEADS involved the Office of the State Controller, the Department of Public Safety, Administrative Office of the Courts, the Department of Justice, the Department of Transportation – Division of Motor Vehicles, the Wildlife Resources Commission, and a variety of other criminal justice organizations to share data for this criminal justice data integration effort. This effort created a comprehensive application that provides enterprise-level data and makes criminal justice professionals more efficient and effective in their day to day work.

Planned Efforts in Data Integration and Analytics

Organizations were asked to provide information about data integration and analysis projects that are in progress or planned for future development and how these efforts will support the organization's business objectives. The following are two significant examples of planned analyses that may be termed BI.

NCFAST - DHHS is developing NCFAST which will provide real time access to North Carolina eligibility case information data. This information will improve customer services as well as providing access to critical information regarding recipient eligibility to reduce Food and Nutrition Services (formerly Food Stamps) and Medicaid fraud.

NCFACTS - The Office of the State Controller is developing NCFACTS, an enterprise fraud, waste and improper payment detection system. This initiative will integrate a wide variety of information including NCAS vendor payments, HR/Payroll and Retirement payments, medical and social service payments, and unemployment benefit payments to identify potential fraud, waste and improper payments. Other key sources of information including demographic data, Social Security Death Index, and national lists of excluded providers, will also be used to analyze payments for suspected fraud, waste and improper payments

Vision for Enterprise Data Integration and Analytics

Agencies were asked to share their vision for enterprise data integration and analytics. Respondents indicated the State may be able to achieve the following through improved access to data and analytic tools:

- Improved efficiency in service delivery and management of state programs through:
  - Better informed (data-driven) decision making.
  - Better outcome-focused programs and services.
  - Greater enforcement of laws, rules, regulations.
  - Improved public safety.
  - Ability to detect fraud.
  - More complex and meaningful statistical and trend analysis.
  - Capabilities for anticipating issues, concerns, problems.
  - Improved efficiencies in public records requests.
  - Cost savings.
  - Better collaboration and sharing of tools and resources among agencies.
- Better use of data for:
  - Improved data quality.
  - Improved incentive for accuracy when sharing information.
  - Easier access to data.
  - Fewer data redundancies.
- Increased transparency.

- Fewer points of entry for data discovery.

Specific suggested concepts for possible BI included the following:

- Developing a central repository of data needed for sharing with good metadata.
- Using BI successes in one agency as model for other agencies.
- Improving state planning through better analysis and understanding of health care utilization and future costs and projected retirement obligations.
- Providing tax, transportation, business, employment, and social services real time data sharing.
- Integrating public records (births, deaths, immunizations, criminal activity) with eligibility systems and program integrity systems.
- Expanding access to SSN, EINs and licensing information in several databases.
- Providing access to other state records for address verification.
- Facilitating favorable impacts on insurance carrier compliance, fire department inspections, workers compensation insurance compliance, insurance rate/risk data in times of disaster, regular reviews of insurance rates by Insurance, enabling DHHS a potentially higher rate and speed of enforcement for child support through better access to integrated data.
- Availability of energy usage data from all agencies on each state building.
- Providing financial and industry trends from third-party analysts.
- Providing workers compensation data for use in other state programs.
- Providing enhanced data sharing of payment and services data.

Although not included in the GBICC initiative scope, numerous specific suggested improvements to probable transaction systems were noted. Examples include:

- Automate and standardize permitting, licensing, and certification.
- One-stop shopping for private businesses.
- Full financial process and data integration.
- The ability to garnish personal and business tax refunds for penalty amounts owed another agency.
- Improve access to apprenticeship data.
- Efficient email restores.
- On-demand access to details on environmental contracts.
- Standardized State model for e-signatures and e-payment.
- Integrated prescription and electronic health records for practitioner use.
- Improve insurance/re-insurance processes for state properties.

Survey Detailed Information Summary

Types of Data Analysis and Tools

The survey responses indicated agencies are currently employing a wide variety of analytical processes. The greatest efforts are focused on retrospective historical and real-

time data analysis. Fewer organizations are focused on predictive and statistical analysis, and other analysis techniques.

Data Analysis Types		
Analysis Type	**Number of Responses**	**Percentage of Total Responses**
Historical	**382**	**39%**
Real time	**293**	**30%**
Statistical	**170**	**17%**
Predictive Modeling	**95**	**10%**
Matching	**14**	**1%**
Benchmarking	**10**	**1%**
Spatial Analysis	**8**	**1%**
Inspections	**8**	**1%**
Conceptual	**7**	**1%**
Vegetative Analysis	**2**	**0%**
Total	**989**	**100%**

Agency respondents listed each type of tool or component used for data analysis, including the vendor name. The types of tools listed ranged from simple spreadsheet tools (e.g., Microsoft Office Excel), to more analytic-specific software (e.g., SAS Business Intelligence Suite).

Other tools listed included supporting components, such as:

- Database management software (e.g., Microsoft SQL Server, Oracle, Microsoft Access)
- Software used to generate reports (e.g., SAP Business Objects and SAP Crystal Reports)
- Software used to generate Web pages (e.g., Microsoft Front Page and Adobe Dreamweaver)
- Third-party subject-matter-specific software for analytics (e.g., ESRI Mapping Software and CyberGrants Website)

In many cases, agency respondents listed multiple tools that they considered components of a particular data analysis process.

The top six tool analytic vendors are shown below.

Summary of Top BI Tool Vendors	
Vendor	**Count of Processes**
Microsoft	**358**
SAS	**94**
Oracle	**74**
SAP	**68**
ESRI	**24**
IBM	**15**
Total	**633**

Likely the wide utilization of Microsoft tools is based upon their mainstream availability and ease of use. Nearly all respondents utilize Microsoft tools to some extent in conjunction with a tool from one of the other top vendors listed above.

See Appendix F for details on the reported tools used for data analysis.

Hosting of Data Analytic Processes

Respondents were asked to share the various hosting scenarios for their data analytic processes. The majority of State Agencies are hosting their data systems at ITS. Second to that, agencies are using their own agency either onsite or at a remote location for hosting.

Hosting Locations		
ITS	**245**	**46%**
Agency Onsite	**117**	**22%**
Agency Site Not Specified	**73**	**14%**
Vendor	**30**	**6%**
NCDOJ	**14**	**3%**
NCDOI	**13**	**2%**
Agency Offsite	**11**	**2%**

Subject Matter, Unit, and Time Period of Data

To better understand the content of data and how it is evaluated, agencies were asked to share the subject matter of their data – what business information is being used. In

addition, agencies were asked about the unit of data that is most often evaluated. Is data analyzed on an individual level, business level, or perhaps by accounting distribution or category of natural resource? And finally, how often is the data analyzed – is data needed on an hourly, daily, weekly or monthly basis? The responses to these questions varied widely.

The 659 agency-reported data analysis processes were categorized according to similar subject matter. Overwhelmingly, the majority of the data subject matter related to financial management and analysis or budgeting. Other high volume areas noted included education; sites, facilities and equipment; permits, licensing and certifications; and personal identity information.

See Appendix G for a complete listing of data subjects.

Over 40 different units of data were listed for the data analysis processes identified. Units of data range from evaluating information about individual or businesses to energy source or water systems.

See Appendix H for a complete listing of units of data tracked.

The majority of responses indicated that agencies process and analyze data daily or monthly and report on that data on a real time basis. Calendar and fiscal year along with fiscal quarters are also commonly used reporting time periods. The time or reporting periods and frequency of data updates are critical to ensuring consistent data interpretation in enterprise situations using shared data elements.

See Appendix I for a complete listing of time periods

Purchased Data

There were few examples of externally purchased data noted in the survey, and no responses indicated purchases of the same data by different business entities. The potential for other agencies, universities, commissions or boards to use these purchased data sources may exist. The examples of purchased data highlighted in the survey are indicated in the table below.

Purchased Data			
Data Source		Annual Cost	Who Uses
US Postal Service Zip Code	$	360	AOC
National Climatic Data Center	$	1,000	DENR
American Resource Easitrack	$	5,000	DENR
WISER	$	5,000	COM
PIERS	$	6,000	COM
US Travel Association	$	50,000	COM
National Database of New Hire data	$	11,731	DHHS
Lexis Nexis	$	150,000	DOR
Appriss	$	35,004	OSC
SSA Death Master Index	$	2,730	OSC
ValueLine	$	1,500	COM
SNL Financial	$	1,200	COM
NC Rate Bureau	$	3,800	COM
TEC Vehicle Valuations	$	36,000	DOT

Governance

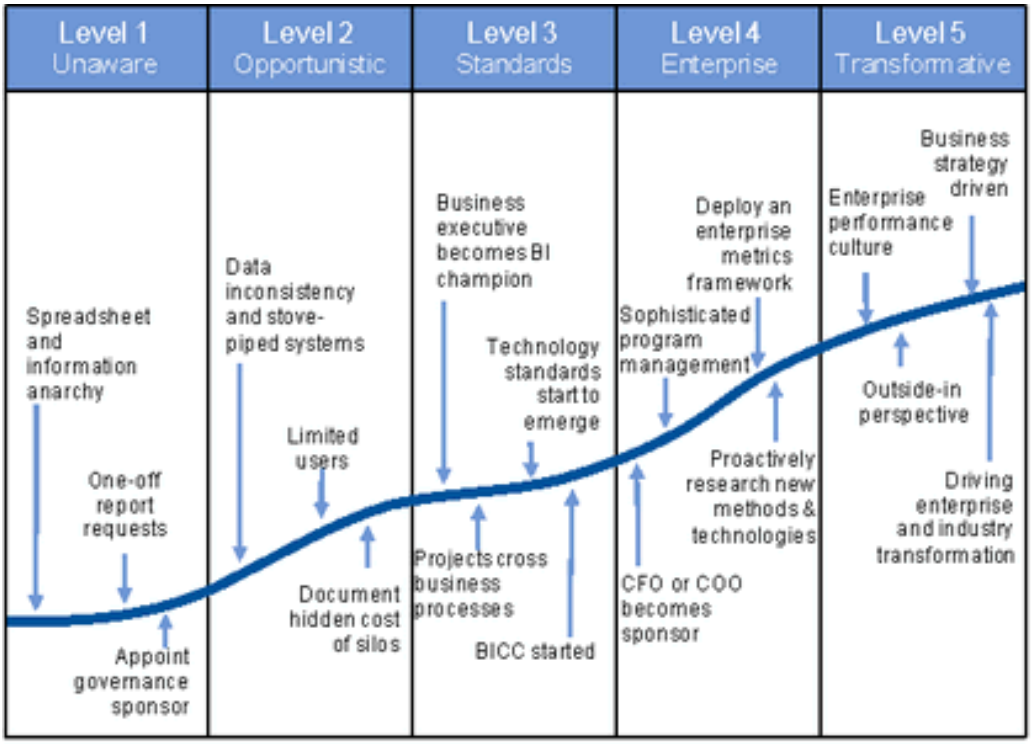
Governance, confidentiality, and legal requirements were recurring concerns throughout the survey responses. Approximately 28% of the data analysis processes were identified as subject to public records laws, making the information available to anyone who requests it. While some of the data analysis processes identified as subject to laws prohibiting data sharing, the primary federal and State statutes noted were: G.S. § 115C, G.S. § 132, G.S. § 143, Health Information Portability and Accountability Act (HIPAA), Family Education Rights and Privacy Act (FERPA), and G.S. § 58. Approximately 8% of the responses stated that the data was confidential without providing the law that prohibits the data to be shared.

V. Needs Assessment

To determine North Carolina's BI needs and to make recommendations for moving the State toward more efficient and effective BI, it becomes important to understand the various levels of BI maturity, the State's readiness for implementing BI capabilities, and the needs identified by the inventory effort.

The Business Intelligence Maturity Model

The BI Maturity Model defines the normal progression organizations follow in transitioning from their current state of data analysis to an organization leveraging BI to drive business decisions. The following Gartner diagram depicts the levels of BI maturity.



BI = business intelligence
BICC = BI competency center

Source: Gartner (August 2010)

Level 1 – Unaware

Level 1 represents the most basic level of data analysis, where organizations collect data in a variety of ad-hoc methods. Often these organizations rely on a few key individuals using basic tools like spreadsheets and simple reporting. In Level 1 organizations, there is little standardized reporting and most information requests are handled as special one-off activities. The focus is often retrospective, historical analysis, asking "what happened." These efforts are often labor-intensive, duplicative and may not provide consistent, accurate information.

Based on the Gartner BI Maturity Model shown above, organizations need a governance sponsor to improve their BI maturity. In North Carolina, the legislature has appointed OSC as a governance sponsor to guide the State in expanding data sharing and analytics and moving toward Level 2 maturity.

Level 2 – Opportunistic

Level 2 represents organizations that recognize the value of analytics within their specific own domain. Each individual project is focused to optimize a process or tactical decision. Data, however, remains stove-piped within transaction systems and data across the organization may be inconsistent in terms of definition, technology, and content. There is little business sponsorship and access to analytic tools remains limited to a few "IT" users with skills and expertise to use such analytic tools. The focus generally remains retrospective but begins to answer questions of how many, how often, and where is the problem. Tools capabilities include standard reports, ad hoc reports and some ability to "drill into" the data.

The Gartner diagram indicates that the legislature and the agencies must understand the hidden cost and complexity of data silos and limited analytics to envision the benefits of advanced analytics in order to progress to Level 3.

Level 3 – Standards

At Level 3 the State will have begun to develop coordinated processes and technologies, have successfully focused on a specific business need, and have business executives championing BI. Funding is provided on a project-by-project basis and projects begin to cross organizations and lines of business and decisions are made based on multiple streams of data. BI begins to provide alerts to the organization (what action is needed) as well as statistical analysis (why is this happening).

Based on the Gartner maturity model, the State's GBICC would add value through standardization of data, technology and governance allowing the departments to progress to Level 4.

Level 4 – Enterprise

The Maturity Model's Level 4 describes organizations that are vested in BI. The agency CFO or agency head become the business sponsor of the initiative. Enterprise standards are implemented and efficiencies are achieved through repeatable development processes, improved governance and data sharing, and value-add to the organization's operation and decision making. BI is able to provide forecasting and predictive modeling, allowing the agency, the State, or the enterprise to anticipate trends and future events. BI tools are made available to analysts, business managers, and senior executives. To manage the increased demand for data and tools, the State must maintain staff with high level skills in many areas including technology, program and change management.

Continuous improvement, research of new technologies, and enhanced data sharing allows the organization to progress to Level 5.

Level 5 – Transformative

Finally, according to the Maturity Model at Level 5 the State's focus would be performance based and allow BI to be driven jointly by its strategic business and IT organizations. Data would be fully utilized to perform retrospective, statistical, and predictive analysis to allow business leaders to respond to changing business conditions with current, easily understood, and easily accessed information for fact-based decision making.

Based on an evaluation of the survey responses, the State's efforts remain primarily in Level 1 and Level 2 of the business maturity models, with most efforts managed within a business domain, supporting specific business objectives to organizations. The State, with the General Assembly's direction, is moving toward Level 3 with initiatives such as CJLEADS, NC FACTS, and NC FAST. These efforts are focusing on cross organization applications where decisions are made based on multiple agency sources of information, support multiple agency user communities and support enterprise decisions. The GBICC will leverage the lessons learned with these efforts to establish standardization and governance to support future enterprise BI efforts.

BI Readiness

To implement a successful BI program, the State must have a realistic understanding of its readiness to adopt and implement enterprise BI. An organization's readiness for BI is based on several key criteria:

1. Current Information – does the organization have access to all the information needed to manage the business decision(s)?

   While the State should, in theory, own all of the State's data, with agencies acting as the stewards of that data, most agencies have indicated that the ability to obtain data needed to make the most informed business decisions is usually very challenging. Survey results indicate that federal and state laws, regulations and policies, real or perceived, prevent access to key information. It is critical that these barriers to sharing data be identified and eliminated.

2. Current BI Capability and Application – does the State have access to the tools and expertise needed to transform existing data in to knowledge?

   The key to comprehensive BI is the ability to transform data into actionable information. Enterprise BI requires tools to extract, transform, and load (ETL) data into repositories for access by BI applications. BI applications may include decision support systems, ad hoc query and reporting, statistical analysis, forecasting and predictive analysis, data mining and management dashboards.

   Survey results indicate that most agencies are using basic reporting and analysis, many leveraging MS Excel and MS Access, in conjunction with their transaction systems. While data from transaction systems is valuable, often the complexity of

the systems and methods for extracting data requires expertise from IT personnel to obtain the correct view of the data. That data is often downloaded into a variety of tools for manipulation, summarization and evaluation by a business user. Often this effort is time consuming, manual, and may provide varying results depending on the method of evaluation. Consistent, easy-to-use BI tools improve the ability of an organization to leverage its data.

3. Timeliness and Data Quality – is the data needed for data analytics available in an acceptable timeframe and of sufficient quality that makes it usable for decision making?

   The ability to make well-informed decisions is clearly dependent on high quality, timely information. Data content, quality and consistency affect the ability to match and integrate data from different sources, the ability to compare and contrast data values, and the ability to analyze data across lines of business.

   Timeliness of data determines the ability to make decisions proactively rather than reactively. While some information needs can be met with data that are days, weeks, or even months old; other analysis may require real-time access to current data. Survey results indicate that the technology of our legacy and transaction systems may impact the ability to control data currency.

4. Business Need – is a clear business need defined to establish the scope and requirements for a BI effort?

   BI success is dependent on a clear understanding of business need. Identifying the key business stakeholders and understanding how information will allow those stakeholders to provide excellent customer service, act as better stewards of state financial and natural resources, and ensure transparency in government business, will enable the BI program to bring value to State organizations.

Potential BI Needs and Solutions

A review of the inventory responses highlighted several areas of potential focus. The identified needs focused on GBICC program management, potential areas of BI to support agencies information needs, and possible redundancies in current systems.

GBICC Program Management – a number of the respondents indicated that data sharing is hampered by a lack of information on available sources of information and tools, and inconsistency in data standards and challenges in establishing data sharing agreements. The following items were noted in survey responses as potential areas where GBICC Program Management could facilitate improved data sharing and analytics.

- Need for information about available data and BI tools

  Several respondents stated that there is a lack of information about what data and tools are available from other agencies. They cited a lack of coordination and communication among agencies concerning common data processes and a lack of coordination in identifying potential sharing opportunities. This was also identified as a problem between divisions in some of the larger agencies. Similarly, information on available BI tools is not readily available to agencies interested in data integration and analytics.

- Need for assistance in developing data sharing agreements – "Building Bridges"

  Several respondents indicated that developing agreements among agencies for data sharing is a major obstacle to effective sharing of information and that guidance and assistance in developing these agreements would facilitate the exchange of information. Respondents also identified the need to better understand federal and state laws and regulations governing data sharing, confidentiality and privacy issues.

- Need for established data and metadata standards

  The lack of standard identifiers, formats, naming conventions among agencies are major factors in preventing sharing of information. At times naming conventions in the receiving agency do not match those in the source agency and the underlying data is found to represent slightly different concepts. In many situations data must be cleansed, translated or even rekeyed to be of value.

GBICC Potential Areas of Focus – a review of the survey responses highlighted key areas of data integration that could provide access to key information and add value to both agency point of service and analytic efforts. The potential action areas:

- Need for a master database of persons receiving state services

  Data analysis processes reported in the survey results contained more information on individuals than any other **unit** of data. Respondents noted the need to consolidate information about individuals to help with more effective identity verification, improved operations, better delivery of services and improved identification of needs for intervention and enhanced fraud detection and prevention.

- Need for a master database of organizations doing business with the states

  The second most identified unit of data was information about businesses. Sharing of information about businesses interacting with the state, from vendors and suppliers to medical insurers and recruitable business and industry, is also very important, according to survey respondents.

- Need for a financial data repository

  The number one **category** of reported "unit of data" was "financial management/analysis and budgeting." In addition to the major transactions systems of NCAS and State Budget, most agencies have at least one major data analysis process involving financial information. Several respondents expressed problems with access to all the data, at the detail level and in a timely manner for the major systems.

- Need for integrated education and workforce information

  A number of survey respondents referenced the integration of education data, including K-12 as well as community college and university data, with workforce data to perform long-term analysis on the impact of education and training on future workforce outcomes.

- Need for a central repository for data sharing

  The definition of BI may be confused with the idea of an established central data repository. The key to data integration is clearly understanding the business need for data, structuring that data to provide the required information and to support future data analysis needs while avoiding unnecessary data replication and storage. While some data sharing needs may be most efficiently addressed by establishing a central repository, this should be done on a case-by-case basis rather than a wholesale enterprise data repository.

- Other needs for consideration

  Together, "project tracking" and "planning and program evaluation" characterized a considerable number of data analysis processes. The commonality of subject matter across agencies is worthy of consideration for cooperative efforts to present the required information on the effectiveness of programs and projects in a shared environment.

  Another area noted by several respondents was the need to have their agency data or that of another agency available as a data layer in GIS format for use with geographic systems. Because of the robust GIS model for BI, it may serve the state well to encourage the addition of select data items to geocode for timely inclusion in the state's GIS system.

In addition to the potential needs for data integration and BI described above, a number of opportunities for possible integration of transaction systems were identified in the survey responses. These applications appear to have common data, processing and reporting needs. While the GBICC statutory language indicates that the GBICC will not

replace transaction systems, it is important to recognize these areas of potential redundancy and potential opportunity for an enterprise solution.

Transaction system redundancies included:

- Licensing, permitting and certification processes.
- Regulation, compliance, inspection and penalties.
- Case management of services, auditing, a legal proceeding.
- Accounts receivables.

VI. Recommendations and Next steps

The GBICC discovered valuable information during the inventory process. Respondents provided general information about agency efforts and needs related to data analysis as well as detailed information about individual data analysis processes. A number of agencies indicated that they currently perform analytics to support their individual organization's needs but enterprise analytics raised concern about data sharing, governance, and privacy issues as well as impact on agency resources. A general sense of doubt about the ability for an enterprise program to provide value to their organization was also noted. In working with the agencies during the survey, answering questions and clarifying information, the GBICC team recognized the criticality of demonstrating the value of an enterprise approach to BI and building agency buy-in and adoption of the program.

Possible Approaches

There are various approaches that may be taken for the implementation of an enterprise BI program.

1. **Enterprise-wide Development** – this approach tackles enterprise analytics through the development and implementation of an enterprise warehouse and begins loading data from a variety of sources for potential future use.

   While benefits to a robust centralized data warehouse include reduced data redundancy and centralized access to a wide range of data, the challenges with this approach are significant and the risk of failure is high.

   Developing a centralized repository and loading various sources of data without clear understanding of the data and business need to use that data can result in:
   - Improper definition and structuring of data in the warehouse, resulting in re-work and inefficiencies when a business need is more clearly defined.
   - Potential data quality issues that are not fully recognized until the data in the warehouse is being used for analytics, resulting in accumulation and storage of data that may prove to be of poor quality for the required analytics.

- Required maintenance to perform updates and keep data stores current when analytics requirements are undefined.
- Costs associated with archiving and storage.

This approach is costly and requires considerable time and effort before significant benefits and value can be realized.

2. **Project Prioritization** – this approach focuses on understanding business needs and prioritizing BI projects based on funding and resource availability.

   There are a variety of benefits to a project prioritization approach, the most important being that BI efforts are based on identified priority business need. Other benefits include:
   - Application of lessons learned and efficiencies from previous BI efforts to new BI projects
   - Ability to leverage data sources from previous BI efforts in new areas of analytics
   - Ability for the business to drive BI efforts, gaining better support and buy-in from agencies
   - Ability to clearly scope project objectives and focus business and technical resources more efficiently

   The challenges with this approach may include the need to delay certain efforts based on available resources and funding, the need to develop each BI data source with consideration for future projects so that data integrated for one BI application will be useful in other analytics. Finally, this approach must remain focused on enterprise analytics to ensure that BI applications continue to expand cross functional data sharing and analysis and avoid creation of siloed BI results.

3. **System Replacement** – this approach develops enterprise BI as aging legacy transaction and analytic systems are replaced over time.

   This approach would enable the State to architect BI into the overall solution when considering new enterprise foundational systems.

   Using this protracted approach to develop BI applications, however, would delay the adoption of data sharing and analytics and would potentially result in additional "siloed" BI solutions based on transaction systems.

Recommended Approach

The GBICC recommends the Project Prioritization approach, clearly identifying and understanding key business needs and developing a project prioritization process that will build on existing GBICC projects CJLEADS and NC FACTS for future BI efforts.

GBICC Plan of Action

The statutory language associated with the GBICC requires the development of a "plan of action" that will:

1. Define program requirements, objectives and end-state of the initiative.
2. Prioritize projects and stages of implementation in a detailed plan and benchmarked timelines.
3. Effectively coordinate all of the State's current data integration initiatives.
4. Utilize a common approach that establishes standards for BI initiatives for all State agencies and prevents the development of projects that do not meet the established standards.
5. Determine costs associated with the development effort and identify potential funding sources.
6. Include a privacy frame work for BI consisting of adequate access controls and end user security requirements.
7. Estimate expected savings.

Next Steps

Based on the inventory analysis, considerable work remains to establish a comprehensive and thoughtful plan of action.

The GBICC will begin the implementation of key GBICC Program Management components to support the development and fulfillment of the GBICC Plan of Action. Top priorities for GBICC program management include:

1. Building consensus and agency "buy-in" for the emerging GBICC initiative to ensure that efforts are focused on appropriate priorities and adding value to the agencies. The ability to build consensus will depend on developing a clear concept of the GBICC and how it will bring value to the agencies.
2. Establishing working groups of business stakeholders to assist with business needs assessment and project prioritization and user community members to provide feedback on analysis needs, techniques and tools.
3. Establishing a register of available data – using the inventory responses, the GBICC will research a mechanism to register data sources and data sources owners for use by all State organizations.
4. Establishment of governance policy, procedures, and guidelines to broker data sharing agreements across organizations including the creation of a legal advisory group of subject matter experts on state and federal privacy, disclosure and security regulations who can provide guidance on data sharing issues and agreements
5. Establishing data and metadata standards based on national standards and industry best practices and determine how enterprise data model management and standards will be implemented
6. Other program areas for consideration include:

a. Contract and license management.
b. Support/Help desk.
c. Technology, architecture and infrastructure.
d. Production system management.
e. Training and Change Management – enhancements, upgrades, and scope expansion.
f. Consulting to business units.

The GBICC will also undertake a more in-depth analysis of areas of focus identified in the inventory survey. This analysis will allow the GBICC to develop potential project and priority recommendations for the GBICC Plan of Action. Top priorities for further research include:

1. Master database of persons receiving state services. Research agency key business needs, potential inhibitors, and costs of developing this capability compared to purchasing similar services from the vendor community.
2. Master database of organizations doing business with the state. Identify key business needs, potential impediments to this effort, and the costs of developing in-house capability versus purchasing similar services.
3. Integrated education and workforce data. Follow the P20W Longitudinal study that is currently underway at DPI and determine how the GBICC can assist with data sharing efforts as well as assist with providing information from that study for other business needs.
4. Financial data repository. Identify the State's direction for financial systems planning and impacts of decisions to begin financial data integration at this time versus postponement until an enterprise financial systems integration effort is underway.
5. Employee mis-classification. While not identified in the inventory, Executive Order 125 established a task force to promote cooperation and data sharing to reduce the instances of employee misclassification leading to employees being deprived of benefits like workers compensation and unemployment insurance, under-reported taxes, and unfair competitive advantages for business violating state and federal labor laws. The GBICC will work with the Task Force and the NC FACTS to ensure collaboration in data sharing and analytics.
6. Further review, evaluation and follow-up on inventory responses as well as the analysis described above will address Phase 2 requirements to: 1) identify redundancies and identify projects that should be discontinued, and 2) determine where gaps exist in current or potential capabilities.

VII. Funding and Expenditures

Session Law 2012-142, HB 950 appropriated $5 million in non-recurring funds to support the enterprise BI program. Of that amount, the OSC may use $750,000 for the administration of the program. The remaining funds are reserved for initiatives

recommended to and approved by the General Assembly. The following chart shows the expenditures as of August 31, 2012.

Estimated FY 2013 as of August 31, 2012	FY 2012-2013 Budget	Available Balance
GBICC Funding		
Program Initiatives	$4,250,000	
Program Administration	$750,000	
	$5,000,000	
GBICC Expenditures		
Total Project FY 2012-2013		
State Project Team Expenditures	$8,073	
GBICC Total	**$8,073**	**$4,991,927**

The OSC must hire additional full-time staff to support the on-going GBICC efforts. In the long-term, recurring funding is necessary to establish permanent positions for the skilled program resources needed to support enterprise BI efforts.

NC Financial Accountability and Compliance Technology Systems (NC FACTS)

I. Summary

Session Law 2011-145, HB 200, directed the Office of the State Controller (OSC) to develop an enterprise process to detect fraud, waste and improper payments throughout state government. Session Law 2012-142, HB 950 placed the NC FACTS program under the Government Business Intelligence Competency Center (GBICC) also managed by the Office of the State Controller. This was done to support the effective and efficient development of State agency business intelligence capability. Additional statutory language to facilitate greater data sharing for enterprise initiatives was also adopted.

The OSC contracted with SAS to design, develop and host the North Carolina Financial Accountability and Compliance Technology System (NC FACTS). This contract is a public private partnership with each party contributing to the successful integration and analysis of the State's data for fraud detection. NC FACTS will apply advanced analytics to the integrated data to create alerts about suspected fraudulent, wasteful, or improper payment activity. Using key identifying and demographic information, NC FACTS will be able to develop relationships and linkages among multiple data sources to indicate potential collusion and/or criminal activity. Because confidential data is critical to the ability to perform fraud analysis, NC FACTS will implement the appropriate technical architecture, security, and user access parameters to protect data in accordance with federal and state regulations. NC FACTS is designed to use the North Carolina Identity (NCID) management application, to allow users to authenticate to NC FACTS using their existing state issued user identification and password.

NC FACTS continues to experience ongoing challenges with agency stakeholder commitment and access to data. The project team continues to focus on identifying agencies most interested in participating in the NC FACTS initiative, developing data sharing best practices, and addressing inhibitors to data sharing. While some agencies have expressed interest in being involved in the development and use of fraud analytic capabilities, others have been slow to partner with the NC FACTS project team in support of the development effort. It has been observed that agency operational priorities are often cited as a limitation on the committing resources to assist NC FACTS.

Data sharing continues to be a challenge as well. Agencies, accustomed to managing data within their siloed applications, struggle with balancing their duty to protect the privacy of "their" North Carolina data with the need to share data to ensure that tax dollars are appropriately used to provide the best value and services for the citizens of North Carolina.

This report highlights the activities of the NC FACTS program since the July 1, 2012 report.

II. Program Requirements

To develop an enterprise program to detect fraud, waste, and improper payments across state government, OSC is partnering with state agencies to identify business needs in the area of fraud, waste and improper payment analysis, detection, and reporting. Data integrated to support one agency's business needs will likely add value to fraud analysis for other agencies and the enterprise. Data governance agreements addressing the data to be shared, technical and user access security protocols, auditing, and more, are critical to sharing North Carolina's information at the enterprise level.

OSC entered into a two-year contract with SAS, with a maximum cost of $8 million. The contract defines a public-private partnership with the State's data integration vendor contributing resources in the amount of $5 million in each of the two contract years (FY11-12 and FY12-13). This partnership ensures active participation and commitment from the State and the data integration vendor and focuses on providing a strong return on the State's investment. The parties will coordinate efforts to report benefits realized for each area of fraud, waste or improper payment analysis.

While the program will expend considerable effort on data collection and integration, support for the business programs responsible for analyzing and investigating the identified fraud incidents is critical. This effort, in collaboration with the business area, will identify the business processes and resources required to recover fraudulent or improper payments, to prevent future incidents of fraud, waste and improper payments, and to ensure that the analytics used to identify these incidents are continually being improved and refined to more accurately evaluate risk and fraud patterns.

III. Program Activities

Project Approach

The development of risk analysis and fraud detection at the enterprise level is an iterative process. Agencies participating in the program may realize "quick hits" based on verification of known business rules within the first few months of the sharing of data. Development of mature analysis, however, will evolve over time as North Carolina's integrated data is used in developing more sophisticated analytic and predictive models, filters, and network analysis. These analytic tools will be further refined based upon analysis, verification and feedback on the fraud alerts generated by the system.

Agencies participating in the NC FACTS program will work with the project team to define their business needs and discuss possible integration points. The following steps will be undertaken.

- Data Governance – Each of the agency stakeholders, OSC, and SAS will work together to review available data and applicable governance rules. The parties will develop a Data Access and Use Agreement (DAUA) that defines the data to be shared, how it can be used, the security rules for data access and any unique requirements associated with the data.

- Data Analysis – The NC FACTS project team will work with each agency to identify the details about the agency's data to be shared, including data definitions, technical formats, transmission options and frequency of update. After agency data is transmitted to the NC FACTS environment, the SAS technical team will perform preliminary analysis on the data content to determine how to integrate it with the enterprise data for analytical processing.

- Business Operations Analysis – The NC FACTS project team will work with each agency to understand its business processes by reviewing existing documentation, participating in meetings and, where appropriate, shadowing business activities, to determine how data captured by the business operation is used to make business decisions.

- Quick Hits – When agency data is initially integrated in NC FACTS, preliminary analysis will identify areas where the data does not meet known business rules. The analysis during this phase will enhance current edits in the agency source system by using data integrated from other sources in NC FACTS. A quick hit, for example, might identify individuals who are deceased or incarcerated and are still receiving payments or services.

- Iterative Development - Using information gathered from this analysis of data, the NC FACTS team will prototype and develop analytic models to support the agency's business needs. The model development will include:
    - Systematic verification that individuals or business entities are who they say they are;
    - Validation that the individual or business entity is complying with rules and regulations;
    - Identification of anomalies and peer group pattern analysis; and
    - Identification of relationships and associations between entities within and across program areas.

Technical Environment and Application Development

The NC FACTS technical infrastructure continues to be developed in the SAS hosted environment. To ensure the appropriate implementation of agency specific data governance rules, the technical design provides the ability to segregate data as needed to meet federal regulations, while permitting business process analytics for that area to use both the segregated data as well as other sources of data. For example, unemployment insurance (UI) data, as defined in the data sharing agreement, must be segregated and used only for UI fraud analysis or other specific business purposes as approved by the data source agency, but other sources of data may be combined to provide a complete analysis for business purposes.

The NC FACTS application will support both point of service and retrospective analysis, and the application will be able to provide "on-demand" verification prior to disbursing funds or validating eligibility for services. Retrospective analysis will review past program activities and payments across the mass of integrated data to identify patterns and anomalies that may indicate suspect activity for investigation.

Access to NC FACTS will be limited to authorized users as identified by the business owners. Business stakeholders will define specific role-based security to authorize access to the integrated data. All end user activity will be logged and available for standard audit reporting.

NC FACTS will use the State standard North Carolina Identity management (NCID) for user authentication. This allows NC FACTS users to access the system with their existing user ID and password. An enterprise authentication application, NCSEAT, has been developed to support any State application hosted at SAS. NCSEAT facilitates the integration of new applications with NCID with minimal impact and additional development work for either the State or SAS.

The development environment infrastructure has been completed and is being used to analyze the data currently available in the NC FACTS environment. The technical infrastructure is expanding to add testing and production environments to allow for analytic model testing and eventual deployment to end users.

Governance

The NC FACTS team worked closely with legal counsel from the State's Attorney General's Office and the affected agencies and SAS to develop a governance model to secure and protect data integrated for this initiative. Using this governance model allows agencies providing data to NC FACTS to define data access and usage requirements

A Data Access and Usage Agreement (DAUA) template has been developed and is available to assist in the development of data sharing agreements between the agencies

and the NC FACTS program. The DAUA may be modified to meet each agency's specific data sharing needs and concerns.

DAUA agreements are in place with the following departments and agencies to share "their" data with NC FACTS.

Date	Department/Agency and Data Source
03/07/2012	Secretary of State Data
05/29/2012	Social Security – Master Death File
06/20/2012	Commerce – Division of Employment Security Data
07/01/2012	Office of State Controller – BEACON Payroll Personnel Data
07/01/2012	Office of State Controller - NC Accounting System Payment Data
08/08/2012	Department of Public Safety – CJLEADS – Incarcerations and Probation Data
09/20/2012	Department of State Treasurer – State Employees Health Plan Data

The NC FACTS team is working with the following departments and/or agencies to develop a DAUA which defines their specific data governance needs.

Agency
Department of State Treasurer – Retirement
Administrative Office of the Courts – CJLEADS Criminal Case Records
Department of Justice – CJLEADS, Sex Offender, Concealed Handgun
Department of Health and Human Services – Vital Records Death Records
Department of Transportation – Division of Motor Vehicles Data

Data Sharing/Agency Activity

The NC FACTS program team is continually working with the agencies to identify the value of data integration, the capabilities of the fraud framework, and benefits to the agency and state.

Data sources currently included in the NC FACTS pilot program:

The Social Security Administration - Master Death File

The Master Death File has been purchased from the Social Security Administration (SSA). This file was originally transmitted to NC FACTS in June 2012 and is updated monthly. The Master Death File is available to all of the State's data integration and business analytics initiatives.

The Department of Secretary of State

The Department of Secretary of State (SOS), is responsible for the oversight and stewardship of information on businesses operating in the State of North Carolina. The

SOS manages corporate registration, Uniform Commercial Code, Charitable Solicitation licensing, and Notary Public commission data.

The SOS corporate data was the first data source shared with NC FACTS. Preliminary analysis of this data did not indicate substantial findings as information in the data warehouse was limited solely to SOS data and lacked historical date necessary for corporate identity theft analysis.

NC FACTS anticipates SOS data analysis will improve as additional state data sources with business and entity information are incorporated into the system and a historical repository of information is captured over time.

The Department of Commerce - Division of Employment Security

The Department of Commerce, Division of Employment Security (DES) executed a DAUA with NC FACTS on June 20, 2012. At that time, DES Information Technology (IT) was experiencing resource constraints due to activity associated with the federal Treasury Offset Programs and the development of an RFP to replace their outdated operations systems, delaying the ability to provide data to the NC FACTS program.

Given the DES IT resource constraints, the NC FACTS project team focused on a review of DES' business processes through meetings and business process overviews with both the benefit payment and employer tax compliance operations.

To minimize the impact on the DES IT resources, the NC FACTS team suggested DES IT review current production extracts to determine if a combination of these programs could support NC FACTS data requirements and avoid the need to develop a new data extracts for NC FACTS at this time. After examining this option, DES IT provided data associated with employer tax compliance on September 28, 2012. NC FACTS expects the delivery of benefit payment information in early October.

The Department of State Treasurer

State Health Plan of North Carolina

The State Health Plan of North Carolina (SHPNC) provides health care coverage for 663,000 teachers, state employees, retirees, current and former lawmakers, state university and community college staff personnel, state hospital staff, and their dependents.

The SHPNC works to identify fraud in areas such as provider billing for improper or unnecessary procedures, falsifying diagnoses, and billing for services not performed. Consumer fraud may include filing claims for services or medications not received or

falsely claiming dependent eligibility. Better access to information and tools may aid in identifying these types of improper payments.

State Treasurer Janet Cowell and the Department of the State Treasurer and the SHPNC are actively working with NC FACTS to initiate pilot program activities. SHPNC has provided information about data available for analysis in the NC FACTS system. SHPNC has signed a Business Associates Agreement with OSC and with SAS to address HIPAA-related requirements for data sharing. On September 20, 2012, a DAUA was signed allowing NC FACTS to receive and analyze data from SHPNC.

The NC FACTS project team is currently working with SHPNC to identify and coordinate access to data for integration and analysis.

Division of Retirement

The Department of the State Treasurer (DST) administers the Teachers and State Employees and Local Governments pension plans for North Carolina's 850,000 public employees.

The management team from the DST Retirement section has indicated interest in the capabilities of NC FACTS and the integration of retirement data for the detection of suspect fraud, waste and overpayments. A draft DAUA has been shared with DST and is under review and consideration.

The Office of the State Controller

The Office of the State Controller manages the North Carolina Accounting System (NCAS) and the BEACON HR/Payroll System. Both systems contain information beneficial to the NC FACTS program.

NCAS manages a statewide vendor list which identifies the vendors that can be paid from the accounting system. This vendor file is currently used to perform debt set-off with the Department of Revenue and will be a valuable data source for NC FACTS to assist in linking vendors throughout state business areas.

The BEACON HR/Payroll system has employee payroll and time information. As NC FACTS works with the State Health Plan on member eligibility, this data will assist in confirming member eligibility and status.

The NC FACTS program has received data associated with both BEACON and NCAS. This data is currently being analyzed and integrated within the NC FACTS program.

The Department of Health and Human Services

The Department of Health and Human Services (DHHS) manages services for one out of every six North Carolinians. With DHHS' combined annual operating budget of $14 billion, the potential for fraudulent, erroneous and wasteful payments exists. Recognizing the possibility for fraudulent activity to occur, DHHS has instituted many initiatives and programs to commence and support investigations.

During interagency discussions related to on-going DHHS anti-fraud efforts, DHHS, OSC, and SAS recognized considerable synergies between the current DHHS Eligibility program and the NC FACTS initiative. With similar data needs, software licensing and hosting requirements, working collaboratively on these two projects offers the State the opportunity to save resources while achieving a common goal. DHHS, OSC and SAS are currently engaged in the process of defining tasks and timelines so that these two efforts can be merged.

OSC will continue to work with DHHS to determine how NC FACTS can use DHHS data in enterprise fraud detection and will identify areas of focus within DHHS that are not being addressed by current fraud efforts.

A DAUA has been drafted to provide access to DHHS – Vital Records death record data. This information is critical to support the analysis of eligibility for services and payments across the enterprise.

Department of Transportation – Division of Motor Vehicles

The Division of Motor Vehicles maintains vehicle registrations and driver license data for North Carolina citizens. This information has been identified as data which can be utilized to support analytical model development associated with various business areas.

The former DMV Commissioner, Mike Robertson, recognized the value of DMV data and agreed to participate in the NC FACTS program. A DAUA has been drafted to provide access to the DMV data and is currently under review.

CJLEADS

CJLEADS integrates criminal records from the Department of Public Safety, Administrative Office of the Courts and Department of Justice to provide a comprehensive view of an offender. Currently an agreement is in place with each agency stakeholder to allow their data to be shared and integrated for use within CJLEADS environment and be made available for criminal justice purposes.

The integration of CJLEADS data in NC FACTS has been identified by many agencies as an immediate business need. The knowledge of prior criminal convictions and/or incarcerations can directly impact service and payment eligibility. NC FACTS has

requested approval from the data source agencies to share their CJLEADS integrated data with NC FACTS.

A CJLEADS specific DAUA has been drafted for each agency for their review and comment. The Department of Public Safety has executed a DAUA to allow their data to be shared with NC FACTS. The Administrative Office of the Courts and Department of Justice have agreed in concept but have yet to execute their agreements and proceed with data sharing.

Pilot Program

The State Health Plan and the Department of Commerce/Division of Employment Security have completed the necessary governance agreements to share data with NC FACTS. As soon as data is transmitted to NC FACTS, fraud analysis will begin with these business areas.

In addition to addressing fraud detection in these areas of analysis, the initial pilot(s) will begin to build enterprise functionality that will be used for future business areas as they are added into the enterprise program. Examples of these enterprise functions potentially include:

- Developing an enterprise view of a person and/or entity;
- Validating businesses with the Secretary of State's corporate filings databases;
- Verifying providers, recipients, and members against the Social Security Death Index and DHHS vital records data;
- Validation of payments against NCAS vendor files; and
- Development of a "do not do business" or "bad actors" file.

The enterprise functions will build the linkages and connectivity are necessary to support enterprise level analysis and reporting. As other critical data sources are added, the enterprise functions will be expanded.

IV. Challenges

Agency Commitment

NC FACTS offers state agencies potential tools to provide added value to their fraud, waste and overpayment identification efforts using integrated statewide data. While agencies see value in the NC FACTS concept and express interest in participating in this enterprise initiative, operational priorities have inhibited their commitment of resources in sharing their data and the business processes. Consequently, the pace of development of analytics to support their organizational anti-fraud efforts has not been at a level satisfactory to this Office.

Due to conflicting priorities in the agencies, the NC FACTS team has found it challenging to develop statements of work for agency development. As a result of these agency priorities, the NC FACTS project team has been forced to redirect resources to investigate other opportunities, while continuing to push for DAUA agreements and release of data.

Resource Limitations

There is no doubt that some agencies are limited from data sharing because of statutory, regulatory or legal challenges, but even when there are no legal impediments, limited agency resources continue to present a challenge with providing data. Despite the fact that executed data access and usage agreements are in place, the lack of agency staff resources to develop data extracts and provide business knowledge to support the essential analysis, continues to delay work effort toward developing fraud, waste and improper payment detection models.

To lessen the impact on technical resources within agencies, the NC FACTS program team has suggested that agencies consider the use of existing data extracts wherever possible. Existing extracts may not be as comprehensive as developing NC FACTS specific extracts, but they may include sufficient data to begin analysis and can be adapted as additional data needs are identified. The Division of Employment Security and the Department of Transportation are currently evaluating this approach.

Data Sharing

The data needed for effective enterprise analysis includes highly sensitive and secure information. The ability to protect Personal Identifying Information (PII), adhere to security and compliance requirements for the Health Information Portability and Accountability Act (HIPAA), and meet the constraints associated with other state and federal laws and regulations associated with tax information and employment data, is critical to sharing information across the enterprise. NC FACTS works closely with agencies to develop the required policies, procedures, contractual agreements, and memorandums of understanding or agreement necessary to define the parameters associated with data sharing of this key information within the State's fraud initiative.

Stringent application security, including physical security, user authentication, role-based security, and data encryption among others, are key components in the implementation of the enterprise fraud detection system. The ultimate success of this initiative is dependent on state agencies that partner and strive to find and implement appropriate policies and controls to enable data sharing. Some of the agencies who serve as data stewards of key data sources have determined that statutory or regulatory provisions prevent the ability to provide or share state data in their possession with this statewide initiative:

Department of Revenue

The Department of Revenue (DOR) houses sensitive information related to business and individual income, revenue, sales and tax information. This information is critical to

analyzing a variety of areas including validating business and individual identities, reviewing provider claims and payments, analyzing recipient eligibility, and recognizing inconsistency in operations across the State's business areas. The Department of Revenue, in response to a data sharing inquiry, indicated that state statutes and regulations, specifically G.S. § 105-259, limits the disclosure of tax-related information. Tax information, defined in that statute, includes information contained on a tax return or obtained through an audit, information on whether or not an individual has filed a tax return or tax report, and a list of names, addresses, social security numbers, or similar information concerning taxpayers. Further, DOR indicated that federal regulations including Section 6103 of the Internal Revenue Code requires that federal returns and return information must be kept confidential except as specifically defined by statute. DOR noted that many of the State's data files co-mingle federal and state data which further complicates the ability to share information with the NC FACTS initiative. Section 7213 of the Internal Revenue Code provides that the unauthorized disclosure of tax information is a felony and is punishable by a fine of up to $5,000 and imprisonment of up to five years. Unauthorized inspection of tax information is a felony and is punishable by a fine of up to $1,000 and imprisonment of up to one year. The Department of Revenue believes that legislation is required to allow the use of State tax information in the fraud, waste and improper payment detection initiative. With the new data sharing legislation in Session Law 2012-142, HB 950, OSC will work with DOR to determine how DOR data may be incorporated into NC FACTS.

Department of Health and Human Services

Department of Health and Human Services (DHHS) stores key information about medical service providers, recipients, and claims, as well as other social services information. DHHS expressed concern about the NC FACTS initiative placing additional burden on their current fraud detection program resources. While NC FACTS may not engage in detailed fraud analysis within Medicaid, the data and results from current Medicaid efforts are vital to enabling linkages and an enterprise view of businesses and individuals. The NC FACTS team recognizes that regulatory requirements related to HIPPA protected information must be addressed.

Program Resources for NC Fraud, Waste and Improper Payment Efforts

NC FACTS will provide data integration and analytics to identify suspect behavior, pattern anomalies, and errors in processing as the basis for detecting, investigating, recouping, and preventing fraud, waste and improper payments. A broader vision, however, is needed to develop a State culture focused on fiscal responsibility and accountability at all levels of State government.

North Carolina State Government serves its citizens and is responsible for ensuring that tax payer dollars are used in a fiscally appropriate manner. A focus on fraud, waste, and improper payment detection and prevention begins with the development of a culture

within State government focused on accountability and transparency. To support this effort the following recommendations are provided:

Code of Conduct

Some, but not all, of North Carolina's State agencies have adopted an employee code of conduct. Consideration should be given to establishing a uniform North Carolina state employee code of conduct to ensure all state employees have a common, clearly defined set of guiding principles under to which to operate. The code of conduct sets the tone for employees and makes clear the expectation of a high standard of professional conduct.

Fraud Reporting

While data integration and analytics will provide the ability to systematically detect fraud through statistical analysis, pattern evaluation, and anomaly detection, information from other sources will continue to provide valuable information on fraudulent activity. Review of existing hotlines and tip reporting should be conducted to ensure that state government employees and the public have easy access to provide key information to state fraud program resources for review and investigation.

Consideration must also be given to the protection of state employees who provide information that they consider to be reasonable evidence of activity involving fraud, waste or improper payments. Consideration of additional language providing "whistle-blower" protection may be necessary to ensure the willingness of employees to report suspect behavior to the appropriate authorities.

Agency Resources

As the NC FACTS application identifies suspect data for review, agencies and the NC FACTS enterprise program must have the necessary resources to verify the accuracy of the findings, to determine the cause of the finding, and to identify and recommend resulting program changes to prevent future incidents. The Office of Internal Audit in the Office of State Budget and Management and the Statewide Internal Control Program in OSC have both identified the need for additional resources to support agencies and provide greater oversight for disbursement of state funds.

Incentives

As the automated fraud detection system is implemented and expanded throughout State business units, OSC anticipates an increase in the number of incidents and types of fraud identified. Identifying fraud is only one step in the process of improving government operations. The ability to investigate and recover funds that were improperly expended -- and more importantly the ability

to prevent future incidents of fraud -- is critical to achieving measureable success in improving government operations.

Except for the Courts, consideration should be given to providing a portion of the funds recovered from fraud, waste and improper payment analytics and recovery efforts to the employees, agencies and organizations as an incentive for the agency to provide the resources, equipment, and programs to analyze, investigate, and recover improperly expended funds. This funding could assist agencies with the essential resources required to adapt business policy and procedures, and improve information technology systems to identify and prevent improper payments.

Measurement of Benefits Realized

As previously mentioned, a number of fraud detection initiatives exist throughout state government. It will be a challenge to clearly distinguish benefits associated with the implementation of the enterprise fraud detection initiative from existing efforts. In order to accurately measure and report on benefits realized, OSC will work closely with partner agencies and organizations to identify ways to supplement existing detection efforts with access to enterprise data and analytics and how newly created tools and capabilities may enable additional fraud detection activities.

As fraud detection improves the ability of state agencies to adapt processes and controls to prevent fraud, quantitative reporting of prevention efforts may be challenging. Estimated benefits will consider historical fraud statistics as well as measured payments that were flagged and stopped prior to payment.

Maintenance of Analytical Models

Enterprise data and robust analytical tools will identify data patterns and anomalies in order to detect fraudulent and improper payments. With advanced analytics, it is likely that the number of identified data anomalies will increase significantly. Because State agencies and organizations have limited resources to review, investigate and recover improper payments, it is critical that the automated fraud detection system provide a feedback mechanism to continually refine the analytic models. As investigators determine which cases involve actual fraud from cases that involve erroneous payments, the models can be adjusted to better identify high risk cases. Feedback will also allow the models to be refined so that suspect criteria are more specific leading to a reduction in the number of "false positive" cases. The feedback can also provide information to stop suspect payments for a review process prior to expending funds.

As the State improves its ability to detect and prevent fraud, individuals who commit fraud will find alternative methods of gaining improper access to payments and services. All analytic models must be flexible and easy to modify

to ensure the State's fraud detection ability maintains pace with the creativity of those trying to defraud the state.

V. Budget

Session Law 2011-145, HB 200, authorized funding of $9 million in the biennium budget for the development of an automated fraud, waste and improper payment data integration program. These funds support OSC's state project team staffing and expenses ($1,000,000) as well as contractual services for the design, development and implementation of data integration and business analytic models for fraud detection ($8 million). To ensure the public-private partnership of this initiative, the State's data integration vendor is required to contribute resources in the amount of $5 million over the next two years ($10 million total). The vendor contribution will provide hosting hardware and technical environment infrastructure, software, support and services for design, development and implementation of data integration and business analytic model development.

Because data sharing challenges significantly inhibited data analysis and development in FY 2012, to ensure adequate progress is being made toward reaching the General Assembly's public/private partnership mandate, OSC negotiated a delayed second payment.

Projected Budget

As of August 31, 2012	FY 2012	FY 2013
Fraud Detection Funding		
State Funding	$1,500,000	$7,500,000
Vendor Financial Contribution	5,000,000	$5,000,000
	$6,500,000	**$12,500,000**
Fraud Detection Expenditures		
State Project Team Expenditures	$500,000	$500,000
Vendor Contracted Services Payment - December, 2011	1,000,000	
Vendor Contracted Services Payment - July, 2012*		3,000,000
Vendor Contracted Services Payment - December, 2012		3,000,000
Vendor Contracted Services Payment - June, 2013		1,000,000
Vendor Hosting, Software and Contracted Services Contribution	5,000,000	5,000,000
NC FACTS Total	**$ 6,500,000**	**$ 12,500,000**

* Vendor Service payment delayed

Actual Expenditures/Vendor Contributions

As of August 31, 2012	FY 2012 Actual	FY 2013 Actual
State Fraud Detection Funding		
State Funding	$1,500,000	$7,500,000
Carryover from FY Year 2012		497,228
Total Budgeted Funds Available	**$ 1,500,000**	**$ 7,997,228**
Expenditures		
State Project Team Expenditures	$102,772	$31,672
Vendor Payments	900,000	
Total Expenditures	**$ 1,002,772**	**$ 31,672**
Total Budget Funds Remaining	**$ 497,228**	**$ 7,965,556**
Vendor Fraud Detection Contribution		
Vendor Financial Contribution - Planned	5,000,000	5,000,000
Carryover from FY Year 2012		768,355
Total Planned	**$ 5,000,000**	**$ 5,768,355**
Vendor Fraud Detection Expenditures - Actual	4,231,645	2,451,218
Total Contributions Remaining	**$ 768,355**	**$ 3,317,138**
Total Budget Funds and Vendor Contribution Remaining		**$ 11,282,693**

Budget Expansion

The NC FACTS program budget funding is funded through June 30, 2013. A budget expansion request will be submitted to support the continued development and expansion of the program through the next biennium.

VI. Next steps

- Continue work on the NC FACTS pilot program areas:
  - Identify data and business requirements
  - Establish additional data sharing agreements
  - Continue analysis of integrated data
    - SOS information
    - SSA Master Death File
    - NCAS vendor and payments data
    - BEACON payroll and time data

- Continue development activities for data integration and business rules
  - Commerce/DES employer filing and unemployment insurance data
  - State Employee Health Plan
- Develop analytic models and reports
- Test and refine application
- Establish business operations including user administration, training and customer support
- Train and support business users
- Identify incidents of fraud, waste, improper payments
- Provide program recommendations for recovery and prevention of identified incidents
- Report benefits realized

- Identify data sharing statutory and regulatory challenges and recommendations for addressing these challenges.

- Identify additional business areas of interest and plan for program expansion.

Criminal Justice Law Enforcement Automated Data Services (CJLEADS)

I. Background

In 2008, the North Carolina General Assembly initiated the Criminal Justice Data Integration Program with a mandate to create a statewide crime analysis system designed to save time, save money, and save lives. Since the project's inception, the Office of the State Controller (OSC) has managed CJLEADS and has worked with SAS as a vendor partner, in collaboration with North Carolina's criminal justice organizations to develop and implement the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) system.

Consistent with the General Assembly's desire to serve criminal justice professionals and improve the safety of North Carolina's citizens, CJLEADS has two primary objectives:

1. To provide a comprehensive view of an offender through a single application, allowing for positive identification of an offender through a photographic image.

2. To provide an "offender watch" capability to alert criminal justice professionals when an offender has a change in status.

Primary statewide deployment activities were completed on schedule by June, 2012. The CJLEADS Business Operations team continues to on-board agencies and train users throughout the state, and provides 24x7 help desk support for all CJLEADS users and agency administrators. Feedback from organizations using CJLEADS continues to be extremely positive.

Continuous improvement of the CJLEADS application ensures that CJLEADS provides law enforcement and the courts with a comprehensive, robust tool that helps reduce crime, prosecute offenders and keep North Carolina safe. As CJLEADS works with the courts, corrections and law enforcement personnel throughout the state, we find that technology and activity associated with public safety, criminal investigations, and other law enforcement activities is constantly changing. While information technology systems typically complete the design and development lifecycle and move into the operations and maintenance phase where project resources are focused primarily on day-to-day application support, the systems can lose relevancy and quickly become obsolete. Because of this technology obsolescence effect and the concurrent elevation in risk associated with law enforcement's use of dated technology, it is critical for the State to use a different project management approach for CJLEADS by continuing system enhancement activities in parallel with operations and maintenance.

Future enhancement efforts are focused on:

1. Critical data to be incorporated into the CJLEADS application such as:
   - Access to Division of Criminal Information (DCI) network for federal data for DCI certified users as well as Hot File status for all law enforcement users.
   - Access to data to support Division of Motor Vehicles partial plate searches.
   - Access to incident-based information from the North Carolina Data Exchange (NC-DEx) being developed by the NC Department of Justice.

2. Critical CJLEADS development to ensure the application can support new and improving technology including an interface to allow users to capture images in the field and leverage the Division of Motor Vehicles facial recognition technology to quickly provide possible identities.

OSC has maintained tight fiscal control over CJLEADS to ensure that state funds have achieved maximum value. During the challenging economic conditions of the last three years, OSC has minimized operating expenses while committing to provide excellent support and development efforts with the resources available. At the end of FY 2011-2012, CJLEADS total project expenditures since inception are estimated to be $24,620,475, approximately 9% under budget.

In FY 2011-2012, CJLEADS recurring funding was reduced from $9 million to $6,632,737. OSC reduced expenditures in FY 2011-2012 by delaying hiring and eliminating key support positions, maintaining a very tight training budget, reducing development hours, and using one-time data integration funds to add critical data and functionality to the system that year. Recognizing the critical nature of the CJLEADS mission, the legislature in S.L. 142, H.B. 950 authorized $2,379,000 in non-recurring funding for the FY 2012-2013 budget to support a migration to a more robust enterprise-capable database system, the development of key data interfaces, and to ensure that the OSC can adequately support the current operations to meet the General Assembly's mandate. Moving forward, stable, recurring funding to support CJLEADS operations and maintenance and continued development is critical to protect the State's investment in CJLEADS and ensure the improved safety of North Carolina criminal justice professionals and citizens.

This report provides detail on the accomplishments and future activities of the CJLEADS program.

II. Statewide Operations

On-boarding and Training

Primary statewide deployment activities were complete in June 2012. Since that time 12 new agencies or divisions were added to CJLEADS for a total of 485 or 91 percent of the state, local and federal criminal justice organizations in North Carolina. The CJLEADS Business Operations Team is available to assist the remaining criminal justice organizations in completing their on-boarding process. Training classes will continue throughout FY 2013.

As of September 19, 2012:

- 485 state, federal, or local law enforcement organizations are licensed to use CJLEADS.
- Over 24,000 end users have been trained in more than 1,900 CJLEADS classes, including classroom, web-based classes and night classes. The end user community includes:
    - Over 7,000 users in 11 State Agencies consisting of law enforcement, judges, prosecutors, clerks, magistrates, probation and parole officers.
    - Over 600 users in 20 Federal Agencies consisting of law enforcement, judicial roles and probation officers.
    - Over 17,000 users in 454 local and public university law enforcement agencies consisting of sworn law enforcement officers and law enforcement support staff.
- The CJLEADS "Train-the-Trainer" program has certified 72 trainers; these trainers have conducted 639 classes for their organizations.
- CJLEADS trainers have traveled over 76,500 miles throughout the State to provide regional training for law enforcement and courts personnel.

Usage

The number of CJLEADS users accessing the application continues to grow. A comparison of usage statistics for the periods of April through June versus July through September indicates:

- The weekly average number of CJLEADS users grew from 7,444 to 8,852.
- The average number of offender and DMV records accessed has also grown in the last quarter from an average of 26 records per user per week to an average of 32 records per user per week.
- Since initial deployment in June 2010, criminal justice professionals have conducted over 9.9 million searches and accessed nearly 8.4 million offender and DMV records.

Recently, CJLEADS was used by law enforcement personnel providing security at the national event in Charlotte.

Feedback

OSC continues to receive positive feedback from users who recognize the value and benefit of CJLEADS and offer suggestions for system refinement and enhancements. Recent anecdotal examples of CJLEADS making a difference for criminal justice professionals include:

- A State Highway Patrol officer reported air card access to CJLEADS is paying off.

  "On 17 July 2012 approximately 8:51 a.m., I stopped a white Chevrolet work van for speeding 73/55. On my initial approach the driver told me he did not have his license on him but that he in fact had one. I obtained his name and D.O.B. and attempted to run them through DCI. I was unable to do so due to the lack of coverage. I immediately ran it through CJLEADS and found the subject to have a NC control number as well as a pending case in Sampson County for NOL [No Operators License]."

- A Greensboro PD CJLEADS administrator commented on his agency's use of CJLEADS

  "I've heard from most of our officers now, and we have over 700, and they all depend on CJLEADS now. It's one of the most used programs next to our dispatch software."

- An officer in the Goldsboro Police Department used CJLEADS Mobile to confirm an offender's identity.

  "I just wanted to tell you guys that yesterday, September 6, 2012, I went to serve felony warrants on a person in Goldsboro, NC. This wanted person was someone unknown to me and as it turned out, he provided me with a fraudulent name and date of birth.

  Since CJLEADS has a mobile website I was able to quickly confirm that the wanted person was providing me with fictitious information by utilizing it from my Android phone. I entered the name and date of birth of the wanted person that I was looking and was able to make a 100% identification that I was being lied to, and that I had the person I wanted before me.

  Needless to say, the arrest was made clearing 7 warrants from NCAWARE as well as a NCIC hit as this person was also wanted by ATF for a serious weapon offense."

- Alcohol, Law Enforcement (ALE) shared how CJLEADS is assisting with intra-agency collaboration.

"ALE was asked to assist the Division of Community Corrections with locating their "top 100" offenders that were in violation of their probation/parole restrictions. ALE officers involved in this initiative, called the Fugitive Apprehension Strike Team, have found 48 of the 100 offenders and have been able to identify approximately 23 additional offenders that are either deceased or out of state. CJLEADS helped them identify offenders who have Parole Warrants that had not been entered into NCAWARE.

What started as an 8 week initiative has been expanded to continue the successful efforts. Officers indicated that CJLEADS is their preferred method of accessing information on offenders. They currently have air-cards and laptops and will be moving to State-issued Blackberry devices by the end of the year."

III. Application Releases

The CJLEADS Project team continues to work with end users, data source agencies, and SAS to incorporate data and enhance functionality deemed critical to meeting the mission of providing a reliable, complete, and simple-to-use application to serve law enforcement and the courts and thereby improve the safety of our State, its communities, and citizens.

Release 6.1 was deployed at the end of July 2012. OSC, working with SAS, built a web-based mobile application. The mobile version of CJLEADS was introduced in June 2012 to a small group of "beta testers" for feedback and suggestions. The month-long beta test period resulted in positive feedback from the beta test user community. Following minor mobile application refinements based on user feedback, the mobile application was released to all CJLEADS users in late July.

Release 7 was deployed on September 26, 2012. Release 7 enhanced existing functionality and refined key reports.

1. **Enhanced Watch Lists –** The group watch list allows multiple CJLEADS users subscribed to a common watch list to receive alerts on the same offenders. A watch list owner is able to add group members, such as task force members who may be monitoring a common group of offenders, to the common watch list. This feature ensures that all members of the group receive the same alerts while eliminating the need for CJLEADS users to individually add those offenders to their personal watch list.

2. **Additional Report Capability –** CHP Violations Report is provided to each Sheriff with information identifying Concealed Handgun Permit (CHP) holders from their county who have committed a felony or disqualifying misdemeanor offense since the issuance of the permit. Based on feedback from several Sheriff's Offices, as well as the Attorney General's office, the report was refined to better identify CHP holders with disqualifying offenses.

IV. Application Enhancement

Consistent with the legislative mandate to provide a comprehensive profile of an offender, development will continue to incorporate enhanced functionality and sources of critical criminal justice information in CJLEADS.

The following functionality will be deployed in upcoming releases of CJLEADS:

Release 8 – Scheduled for December 2012

1. **Statewide Warrants Repository Interface –** Law enforcement and the courts have indicated that real-time access to time-sensitive information in the on-line statewide warrant system is critical. To provide this capability, CJLEADS is partnering with the AOC to develop a web service query that will allow users to search outstanding processes in the statewide warrant repository whenever a CJLEADS query is run. In addition, a link to allow users to quickly log on to NCAWARE will improve law enforcement efficiency.

2. **DMV Partial Plate –** Currently the CJLEADS/DMV interface allows for vehicle searches using an exact license plate match or a partial Vehicle Identification Number (VIN). Partial plate searches must be manually processed by DMV staff using mainframe programming taking considerable time and staff resources to complete. Because witnesses often remember only parts of the license plate during a traffic or crime incident, law enforcement indicated that searching partial plates online would enhance the ability to respond to incidents more quickly.

3. **Alert for Confidential License Plates –** Law enforcement has requested an alert mechanism to enable automatic notification anytime a DMV vehicle check is run against a confidential license plate.

4. **Additional Reports –** A report to identify North Carolina probationers who have had any criminal justice activity since the last scheduled check-in has been requested by the U.S. Probations Office.

Future Functionality

The following areas are being reviewed for future releases of the CJLEADS application:

1. **Federal Interface – Division of Criminal Information (DCI)**
   Both the courts and law enforcement have emphasized the critical need for a federal interface to allow users access to federal and other states' information via CJLEADS. There are a number of security and policy issues that must be addressed to allow CJLEADS to develop an interface to federal systems. CJLEADS, in collaboration

with the State Bureau of Investigation, North Carolina's CJIS Security Agency, and the North Carolina Department of Justice (NC DOJ) Information Technology Division, will develop policies and protocols to allow access to federal and other states' information.

CJLEADS and the NC DOJ have had ongoing discussions about incorporating a DCI interface into the CJLEADS application. DCI will control access from the CJLEADS application by verifying the CJLEADS user against the DCI certification database. Only DCI certified users would be allowed to submit inquiries to the DCI message switch for federal information. CJLEADS would audit all initiated searches, but DCI would audit and control the data transmitted back to CJLEADS users through the message switch. DCI will continue to require that all users utilizing this access be trained and certified for DCI use. In addition, the development of the DCI interface will allow for Hot File status (wanted persons, stolen vehicles and stolen weapons) to be available for all CJLEADS law enforcement officers, regardless of DCI certification.

NC DOJ and CJLEADS are now conducting regular meetings to address key business and technical issues associated with the development of the DCI interface. NC DOJ has indicated that they will have web service capabilities developed by December, 2012. CJLEADS will begin the development of the DCI interface as soon as web services are available with a planned deployment in Spring 2012. In the future, DCI is planning to migrate to NCID as its user authentication method which would allow common login for both CJLEADS and DCI.

2. **NC-DEx**

   CJLEADS is partnering with the NC Department of Justice Information Technology Division to establish a web interface between the North Carolina Data Exchange (NC-DEx) – formerly known as CAPTURES. This interface to the comprehensive incidents database will enable the accurate and timely sharing of law enforcement data and allow authorized NC-DEx users to log into that system from within CJLEADS.

3. **Facial Recognition**

   The ability to positively identify a suspect, offender, or unknown person in the field is critical to law enforcement. The CJLEADS team, in collaboration with DMV, will evaluate the ability to capture a photograph in the field and find potential matches for identification purposes by leveraging the existing DMV facial recognition technology.

4. **Juvenile Case Records**

   Finalization of business requirements for the data, security and auditing is still pending. AOC's current resources are not currently sufficient to undertake this development task.

5. Business Analytics

With the data integrated into CJLEADS, there is great potential to mine the data for statistical analysis and reporting. Court and law enforcement personnel have suggested many opportunities to leverage the information in CJLEADS to improve efficiencies and effectiveness throughout the criminal justice community. The project team will work with business users to determine requirements for data analytics.

The State project team continues development of these reports, and each report will be deployed in system releases as they are completed. Examples of potential reports and business analysis include:

1. Risk assessment for offenders based on historical data and statistical analysis.
2. Offender relationships and connections with other offenders.

V. Database Upgrade

The CJLEADS application is currently based on Asterdata database technology. After several years of operation, experience with the CJLEADS application has highlighted technical limitations of the technology resulting in increased support issues, performance deficiencies during defined periods of the day, and limited ability to work with large datasets. The Asterdata technology was also recently acquired by another technology vendor so the future of the product is somewhat uncertain.

Following an evaluation of database options, Oracle Exadata was deemed to provide the most robust solution and provide a foundation for future enterprise data integration efforts. The migration to the Oracle technology will provide improved performance, support, security and auditing capabilities.

The original contract for the hosting and support of CJLEADS provided that if either SAS or OSC, in the exercise of reasonable judgment, determined that continued use of the Asterdata product presented a material risk to the long-term viability of the CJLEADS, SAS would complete the re-architecture and migration of CJLEADS to the new database technology at no additional cost. OSC will be responsible for additional hosting and operations costs associated with the Oracle database infrastructure and licensing. The migration to the Oracle database platform is scheduled for completion by the end of June, 2013.

VI. Challenges

The integration of data across multiple and often disparate applications brings with it many challenges. The following issues have been identified:

A. Funding Availability

The original CJLEADS three-year cost estimates, including initial pilot startup costs in FY 2008-09, were $27 million to support 30,000 criminal justice professionals statewide. Including FY 2011- 2012 costs of $6,971,497, the total cost of statewide deployment is $24,620,475, approximately 9% under budget. Estimates of annual operations and maintenance costs are estimated at $8 million.

Actual/Estimated Costs

	FY 2008-2009 Actual	FY 2009-2010 Actual	FY 2010-2011 Actual	FY 2011-2012 Actual	FY 2012-2013 Estimated Cost	FY 2013-2014 Estimated Cost
SAS Hosted Solution						
State Operations	$128,091	$390,601	$1,415,978	$1,594,888	$2,361,737	$1,950,000
Development/Hosting/Software	$2,000,000	$7,252,426	$6,460,491	$5,378,000	$6,650,000	$6,050,000
Total	**$2,128,091**	**$7,643,027**	**$7,876,469**	**$6,972,888**	**$9,011,737**	**$8,000,000**

The FY 2012-2013 recurring appropriation for CJLEADS is $6.6 million. Recognizing the critical nature of the CJLEADS mission, S.L. 142, H.B. 950, appropriated $2.38 million in non-recurring funds to enable the Oracle database upgrade and continued application enhancement. The continuation budget will need to be adjusted in future years to meet increased cost requirements for operations and maintenance with the new database technology. The following chart provides an explanation of the funding and expenditures:

Funding/Expenditures

As of August 31, 2012	FY 2012-2013 Budget	Actuals	Available Balance
CJLEADS Funding			
Recurring Funding	$6,632,737		
One-time Project Funding	$2,379,000		
	$9,011,737		
CJLEADS Expenditures			
Total Project FY 2012 - 2013			
State Project Team Expenditures	$2,413,737	$266,247	
Hosting Contract Services	1,550,000		
Development/Support Contract Services	2,048,000		
SAS ELA Renewal	2,000,000		
Oracle Upgrade Hosting Costs	1,000,000		
CJLEADS Total	**$ 9,011,737**	**$ 266,247**	**$ 8,745,490**

The CJLEADS application and the data integrated thus far represents a solid foundation for the support of criminal justice agencies and their personnel, but a tremendous amount of work remains to fully meet the mission and objectives established by the North Carolina General Assembly. Completing the integration of real-time North Carolina information, adding an interface for federal information, fully leveraging the DMV interface capabilities and providing additional reporting is critical to serve law enforcement with a single robust and reliable source of information.

Budget Expansion Request

Reduced funding adversely impacts the project's ability to enhance the functionality of CJLEADS for additional real-time data access and reporting capabilities, as well as addressing changing technology needs. The non-recurring funding for FY 2012-2013 provided funds to continue enhancements and complete the Oracle database upgrade this year. A budget expansion request will be required to restore the recurring CJLEADS appropriation to $8 million. The additional funds will be needed for the increased hosting and support costs with the more robust data base technology, on-going operations, and protection of the State's investment in CJLEADS by minimally funding continuing enhancements to the application to keep pace with evolving technology.

Return on Investment

The value of the CJLEADS data and functionality to the State, the courts and law enforcement is significantly greater than the development and operations and maintenance costs. Return on investment is found as intangible benefits of improved efficiency, better informed decision making, and improved safety for law enforcement and the public. The ability to access integrated statewide information in a single web-based application allows the courts and law enforcement to save valuable time researching information and focus their efforts on more important

public safety specific job responsibilities. These benefits permit criminal justice professionals to be safer, more effective and more efficient.

Intangible benefits for FY 2011-2012, based on actual usage of the application are approximately $15.8 million. Future annual benefits, based on usage statistics of the trained CJLEADS user population in May, 2012 with a 10% growth in FY 2013, are estimated to be approximately $21.7 million. For detailed analysis of the ROI, please see Appendix J.

B. Infrastructure

With the budget reductions noted earlier in this report, there are several concerns related to Information Technology costs and services to support CJLEADS.

As the project team evaluates options for incorporating federal information into CJLEADS, the program will be required to implement more stringent security protocols, including two-factor or advanced authentication. Two-factor authentication involves "something the user knows" and "something the user has" in order to access the system. For example, the user knows his user ID and also provides an access code from a physical or virtual token to which only he has access. Using these two factors, the application provides a higher level of access security than simply using a user ID which may be compromised. Initial cost estimates for two factor authentication through the State's ITS enterprise services were extraordinarily high ($16M). As a consequence, the team is continuing to search for more cost effective alternatives.

Finally, CJLEADS is leveraging the State's standard identity management system, NCID. A number of agencies, including federal organizations and some local law enforcement agencies, do not readily meet the NCID user-type categories. While the CJLEADS team has worked with ITS to establish an interim solution for these groups, a long-term resolution for these sworn law enforcement organizations is required from ITS.

C. JWISE

The integration of JWISE data remains a priority for CJLEADS. JWISE data will serve as an indicator for AOC and DPS authorized criminal justice professionals that juvenile court records are available. While significant work toward defining the business requirements for the inclusion of JWISE has been completed with AOC and DPS, the progress on JWISE data has been impacted as resource constraints at AOC prevent finalizing the business requirements and developing the data extract to provide data to CJLEADS.

D. No Cost for Law Enforcement

Throughout the term of this project, local law enforcement has expressed concern about limited local government budgets and increasing costs associated with ensuring public safety. The OSC agrees with the General Assembly's position that there should be no usage fees for law enforcement to access the CJLEADS application. CJLEADS

provides valuable, much needed access to the statewide library of data through a single, secure system. To ensure wide-spread adoption and usage of CJLEADS, OSC recommends that the General Assembly continue to fully fund and support the CJLEADS program for sworn law enforcement organizations with an operational presence in North Carolina. In addition, OSC strongly recommends that there be no cost for the administration of NCID user accounts for non-state law enforcement organizations.

VII. Next Steps

1. Release 8 – (Scheduled for December 2012)
   a. Statewide Warrants Repository Interface –A web service to allow users to search outstanding processes in the statewide warrant repository whenever a CJLEADS query is run. In addition, a link to allow users to quickly log on to NCAWARE would improve efficiencies for law enforcement.
   b. DMV Partial Plate – A search mechanism to facilitate partial plate searches.
   c. Alert for Confidential License Plates – An alert mechanism to enable automatic notification anytime a DMV vehicle check is run against a confidential license plate.
   d. Additional Reports – A report to aid the U.S. Probations Office identifying North Carolina probationers who have had any criminal justice activity since the last scheduled check-in.

2. State and vendor team will begin the database migration project to transition CJLEADS to a more robust, enterprise database architecture.

3. Vendor hosting and support will continue.

4. The State project team will document areas for continuous improvement and future enhancements for the CJLEADS application.

VIII. Appendix

Appendix A

Session Law 2012-142, HB 950

ENHANCE ENTERPRISE-LEVEL BUSINESS INTELLIGENCE TO INCREASE EFFICIENCY IN STATE GOVERNMENT

SECTION 6A.7A.(a) Creation of Initiative. –

(1) Creation. – The enterprise-level BI initiative (initiative) is established in the Office of State Controller. The purpose of the initiative is to support the effective and efficient development of State agency BI capability in a coordinated manner and reduce unnecessary information silos and technological barriers. The initiative is not intended to replace transactional systems, but is instead intended to leverage the data from those systems for enterprise-level State BI.

The initiative shall include a comprehensive evaluation of existing data analytics projects and plans in order to identify data integration and BI opportunities that will generate greater efficiencies in, and improved service delivery by, State agencies. The Office of State Controller may partner with current vendors and providers to assist in the initiative. However, to limit the cost to the State, the Office of the State Controller shall use current licensing agreements wherever feasible.

(2) Application to State government. – The initiative shall include all State agencies, departments, and institutions, including The University of North Carolina.

(3) Governance. – The State Controller shall lead the initiative established pursuant to this section. The Chief Justice of the North Carolina Supreme Court and the Legislative Services Commission each shall designate an officer or agency to advise and assist the State Controller with respect to implementation of the initiative in their respective branches of government. The judicial and legislative branches shall fully cooperate in the initiative mandated by this section in the same manner as is required of State agencies.

SECTION 6A.7A.(b) Government Business Intelligence Competency Center. –

(1) GBICC established. – There is established in the Office of the State Controller the Government Business Intelligence Competency Center (GBICC). GBICC shall assume the work, purpose, and resources of the current data integration effort in the Office of the State Controller and shall otherwise advise and assist the State Controller in the management of the initiative. The State Controller shall make any organizational changes necessary to maximize the effectiveness and efficiency of GBICC.

(2) Powers and duties of the GBICC. – The State Controller shall, through the GBICC, do all of the following:

a. Continue and coordinate ongoing enterprise data integration efforts, including:

1. The deployment, support, technology improvements, and expansion for CJLEADS.
2. The pilot and subsequent phase initiative for NC FACTS.
3. Individual-level student data and workforce data from all levels of education and the State workforce.
4. Other capabilities developed as part of the initiative.

b. Identify technologies currently used in North Carolina that have the capability to support the initiative.
c. Identify other technologies, especially those with unique capabilities, that could support the State's BI effort.
d. Compare capabilities and costs across State agencies.
e. Ensure implementation is properly supported across State agencies.
f. Ensure that data integration and sharing is performed in a manner that preserves data privacy and security in transferring, storing, and accessing data, as appropriate.
g. Immediately seek any waivers and enter into any written agreements that may be required by State or federal law to effectuate data sharing and to carry out the purposes of this section.
h. Coordinate data requirements and usage for State BI applications in a manner that (i) limits impacts on participating State agencies as those agencies provide data and business knowledge expertise and (ii) assists in defining business rules so the data can be properly used.
i. Recommend the most cost-effective and reliable long-term hosting solution for enterprise-level State BI as well as data integration, notwithstanding Section 6A.2(f) of S.L. 2011-145.

SECTION 6A.7A.(c) Implementation of the Enterprise-Level BI Initiative. –

(1) Phases of the initiative. – The initiative shall commence no later than August 1, 2012, and shall be phased in accordance with this subsection. The initiative shall cycle through these phases on an ongoing basis:

a. Phase I requirements. – In the first phase, the State Controller through GBICC shall:

1. Inventory existing State agency BI projects, both completed and under development.
2. Develop a plan of action that does all of the following:

I. Defines the program requirements, objectives, and end state of the initiative.

II. Prioritizes projects and stages of implementation in a detailed plan and benchmarked timeline.

III. Includes the effective coordination of all of the State's current data integration initiatives.

IV. Utilizes a common approach that establishes standards for BI initiatives for all State agencies and prevents the development of projects that do not meet the established standards.

V. Determines costs associated with the development effort and identifies potential sources of funding.

VI. Includes a privacy framework for BI consisting of adequate access controls and end user security requirements.

VII. Estimates expected savings.

3. Inventory existing external data sources that are purchased by State agencies to determine whether consolidation of licenses is appropriate for the enterprise.

4. Determine whether current, ongoing projects support the enterprise-level objectives.

5. Determine whether current applications are scalable, or are applicable for multiple State agencies, or both.

b. Phase II requirements. – In the second phase, the State Controller through the GBICC shall:

1. Identify redundancies and determine which projects should be discontinued.

2. Determine where gaps exist in current or potential capabilities.

c. Phase III requirements. – In the third phase:

1. The State Controller through GBICC shall incorporate or consolidate existing projects, as appropriate.
2. The State Controller shall, notwithstanding G.S. 147-33.76 or any rules adopted pursuant thereto, eliminate redundant BI projects, applications, software, and licensing.

3. The State Controller through GBICC shall complete all necessary steps to ensure data integration in a manner that adequately protects privacy.

(2) Commencement of projects. – Subject to the availability of funds, and subsequent to the submission of the written report required by sub-subdivision a. of subdivision (1) of subsection (e) of this section, the State Controller shall begin projects to carry out the purposes of this section no later than November 1, 2012. The State Controller may also expand existing data integration or BI contracts with current data integration efforts, as appropriate, in order to implement the plan required by this section in accordance with the schedule established and the priorities developed during Phase I of the initiative, and may use public-private partnerships as appropriate to implement the plan.

SECTION 6A.7A.(d) Funding. **–**

(1) Allocation. – Of the funds appropriated from the General Fund to the General Assembly for the 2011-2013 fiscal biennium, the sum of five million dollars ($5,000,000) shall be used to fund the initiative established by this section. The Office of the State Controller shall use up to seven hundred fifty thousand dollars ($750,000) to cover the cost of administering the initiative.

(2) Federal funds. – The Office of State Controller, with the support of the Office of State Budget and Management, shall identify and make all efforts to secure any matching funds or other resources to assist in funding this initiative.

(3) Use of savings. – Savings resulting from the cancellation of projects, software, and licensing, as well as any other savings from the initiative, shall be returned to the General Fund and shall remain unexpended and unencumbered until appropriated by the General Assembly in a subsequent fiscal year. It is the intent of the General Assembly that expansion of the initiative in subsequent fiscal years be funded with these savings and that the General Assembly appropriate funds for projects in accordance with the priorities identified by the Office of the State Controller in Phase I of the initiative.

SECTION 6A.7A.(e) Reporting. **–**

(1) Routine reports. – The Office of the State Controller shall submit and present the following reports:

a. By no later than October 1, 2012, a written report on the implementation of Phase I of the initiative and the plan developed as part of that phase to the Chairs of the House of Representatives Appropriations and Senate Base Budget/Appropriations Committees, to the Joint Legislative Oversight Committee on Information Technology, and to the Fiscal Research Division of the General Assembly. The State Controller shall submit this report prior to implementing any improvements, expending funding for expansion of existing BI efforts, or establishing other projects as a result of its evaluations.

b. By February 1, 2013, and quarterly thereafter, a written report detailing progress on, and identifying any issues associated with, State BI efforts.

(2) Extraordinary reports. – The Office of the State Controller shall report the following information as needed:

a. Any failure of a State agency to provide information requested pursuant to this section. The failure shall be reported to the Joint Legislative Committee on Information Technology and to the Chairs of the House of Representatives Appropriations and Senate Base Budget/Appropriations Committees.

b. Any additional information to the Joint Legislative Commission on Governmental Operations and the Joint Legislative Oversight Committee on Information Technology that is requested by those entities.

SECTION 6A.7A.(f) Duties of State Agencies. –

(1) Duties of State agencies. – The head of each State agency shall do all of the following:

a. Grant the Office of the State Controller access to all information required to develop and support State BI applications pursuant to this section. The State Controller and the GBICC shall take all necessary actions and precautions, including training, certifications, background checks, and governance policy and procedure, to ensure the security, integrity, and privacy of the data in accordance with State and federal law and as may be required by contract.

b. Provide complete information on the State agency's information technology, operational, and security requirements.

c. Provide information on all of the State agency's information technology activities relevant to the State BI effort.

d. Forecast the State agency's projected future BI information technology needs and capabilities.

e. Ensure that the State agency's future information technology initiatives coordinate efforts with the GBICC to include planning and development of data interfaces to incorporate data into the initiative and to ensure the ability to leverage analytics capabilities.

f. Provide technical and business resources to participate in the initiative by providing, upon request and in a timely and responsive manner, complete and accurate data, business rules and policies, and support.

g. Identify potential resources for deploying BI in their respective State agencies and as part of the enterprise-level effort.

h. Immediately seek any waivers and enter into any written agreements that may be required by State or federal law to effectuate data sharing and to carry out the purposes of this section, as appropriate.

SECTION 6A.7A.(g) Miscellaneous Provisions. **–**

(1) Status with respect to certain information. – The State Controller and the GBICC shall be deemed to be all of the following for the purposes of this section:

a. With respect to criminal information, and to the extent allowed by federal law, a criminal justice agency (CJA), as defined under Criminal Justice Information Services (CJIS) Security Policy. The State CJIS Systems Agency (CSA) shall ensure that CJLEADS receives access to federal criminal information deemed to be essential in managing CJLEADS to support criminal justice professionals.

b. With respect to health information covered under the Health Insurance Portability and Accountability Act of 1996 (HIPAA), as amended, and to the extent allowed by federal law:

1. A business associate with access to protected health information acting on behalf of the State's covered entities in support of data integration, analysis, and BI.
2. Authorized to access and view individually identifiable health information, provided that the access is essential to the enterprise fraud, waste, and improper payment detection program or required for future initiatives having specific definable need for the data.

c. Authorized to access all State and federal data, including revenue and labor information, deemed to be essential to the enterprise fraud, waste, and improper payment detection program or future initiatives having specific definable need for the data.

d. Authorized to develop agreements with the federal government to access data deemed to be essential to the enterprise fraud, waste, and improper payment detection program or future initiatives having specific definable need for such data.

(2) Release of information. – The following limitations apply to (i) the release of information compiled as part of the initiative, (ii) data from State agencies that is incorporated into the initiative, and (iii) data released as part of the implementation of the initiative:

a. Information compiled as part of the initiative. – Notwithstanding the provisions of Chapter 132 of the General Statutes, information compiled by the State Controller and the GBICC related to the initiative may be released as a public record only if the State Controller, in that officer's sole discretion, finds that the release of information is in the best interest of the general public and is not in violation of law or contract.

b. Data from State agencies. – Any data that is not classified as a public record under G.S. 132-1 shall not be deemed a public record when incorporated into the data resources comprising the initiative. To maintain confidentiality requirements attached to the information provided to the State Controller and GBICC, each source agency providing data shall be the sole custodian of the data for the purpose of any request for inspection or copies of the data under Chapter 132 of the General Statutes.

c. Data released as part of implementation. – Information released to persons engaged in implementing the State's BI strategy under this section that is used for purposes other than official State business is not a public record pursuant to Chapter 132 of the General Statutes.

SECTION 6A.7A.(h) G.S. 75-66(d) reads as rewritten:

"(d) Nothing in this section shall:

(1) Limit the requirements or obligations under any other section of this Article, including, but not limited to, G.S. 75-62 and G.S. 75-65.

(2) Apply to the collection, use, or release of personal information for a purpose permitted, authorized, or required by any federal, State, or local law, regulation, or ordinance.

(3) Apply to data integration efforts to implement the State's BI strategy as provided by law or under contract."

Appendix B

Entities Surveyed

Agency	Survey Return Date
ABC Commission	08/31/12
Administrative Office of the Courts	09/04/12
Appalachian State University	09/07/12
Banking Commission	09/04/12
Credit Union Commission	09/03/12
Department of Administration	09/04/12
Department of Agriculture	09/04/12
Department of Commerce	09/04/12
Department of Cultural Resources	09/05/12
Department of Environmental & Natural Resources	09/04/12
Department of Health & Human Services	09/05/12
Department of Insurance	09/04/12
Department of Justice	09/04/12
Department of Labor	09/04/12
Department of Public Instruction	09/04/12
Department of Public Safety	09/06/12
Department of Revenue	09/05/12
Department of State Treasurer	09/04/12
Department of Transportation	09/06/12
Division of Employment Security	08/31/12
East Carolina University	09/07/12
Elizabeth City State University	09/07/12
Fayetteville State University	09/07/12
Industrial Commission	09/06/12
NC Community College System	09/06/12
NC Education Lottery	09/05/12
NC Housing Finance Agency	09/04/12
NC School of Science and Math	09/07/12
NC State Education Assistance Authority	Did not respond
NC State Health Plan	09/04/12
North Carolina Agricultural & Technical State University	09/07/12
North Carolina Central University	09/07/12
North Carolina State University	09/07/12

Appendix B

Entities Surveyed Continued

Agency	Survey Return Date
Office of Administrative Hearings	09/04/12
Office of Information Technology Services	09/04/12
Office of State Budget and Management	09/04/12
Office of the State Controller	09/04/12
Office of State Personnel	09/04/12
Office of the Governor	09/04/12
Office of the Lieutenant Governor	08/31/12
Office of the State Auditor	09/04/12
President Pro Tempor of the Senate	09/04/12
Rural Electrification Authority	09/06/12
Secretary of State	09/04/12
Speaker of the House of Representatives	09/04/12
State Board of Education	09/04/12
State Board of Elections	09/07/12
Supreme Court of North Carolina	09/04/12
UNC - General Administrations	09/07/12
UNC - School of Arts	09/07/12
University of North Carolina at Asheville	09/07/12
University of North Carolina at Chapel Hill	09/07/12
University of North Carolina at Chapel Hill Hospitals	09/28/12
University of North Carolina at Charlotte	09/07/12
University of North Carolina at Greensboro	09/07/12
University of North Carolina at Pembroke	09/07/12
University of North Carolina at Wilmington	09/07/12
Utilities Commission - Commission Staff	09/05/12
Utilities Commission - Public Staff	09/04/12
Western Carolina University	09/07/12
Winston-Salem State University	09/07/12
Wildlife Resource Commission	09/04/12
Total Surveys Requested	**62**

Appendix C

General Information Survey Questions

	General Information Survey Question	Number of Responses	% Responding Compared to Total Surveys Completed
GBICC Inventory Survey			
Current Processes			
1	Name the data analysis processes you currently have in place that share data with your agency personnel, other agencies (state, federal or local) or the public. (You will be giving detailed information on each of these and all other instances of your agency's data-sharing processes under the worksheet tab labeled "Inventory Survey.")	98	90%
2	Name the main business users of your data and indicate whether they are external or internal to your agency.	96	88%
3	List the type(s) of information that you could use from another agency or outside source to improve your agency's reporting and/or decision-making processes (this would be something you are currently not receiving). Describe how this information would benefit your agency.	92	84%
4	State the obstacles that you have encountered in obtaining outside data needed for your decision-making, analysis, or reporting. Indicate how these obstacles are preventing access to the data or making information obtained problematic or unreliable.	95	87%
5	Shared data can prove to be less useful than desired because of differences in agency codes (e.g., geographic or agency codes), time periods, formats, etc. Specify what shared data you have found problematic due to such inconsistencies. Were you successful in overcoming the problems? Why or why not?	95	87%
6	Describe instances you know of data redundancy in your or another agency (re-keying, data extracts to multiple agencies, etc.). In each instance, give the main reason that the redundancy has not been overcome.	94	86%
7	Of which current data-sharing project are you most proud/satisfied? What worked in your cooperative efforts to make this project a success? What advice can you give?	93	85%
Planned Processes and Expansion of Existing Processes			
8	What data-sharing initiatives do you plan for your agency over the next few years, in terms of data you can supply and/or data you plan to receive. Include state, federal, local, and private sources.	95	87%
8a	What are the major questions that each of these initiatives will help you answer?	85	78%
Vision for Future of North Carolina			
9	Specific Improvements in Data Access	91	
Benefits and Inhibitors to Data Sharing			
10	Potential Inhibitors	96	88%
11	Potential Benefits	89	82%

Appendix D

Inventory Survey Questions

	Inventory Survey Question	Number of Responses	% Responding Compared to Total Surveys Completed
GBICC Inventory Survey			
Data Analysis Process			
1	Provide the name of the process.	651	99%
2	Select the status of this data analysis process (current, in-development, or planned)?	645	98%
2a	Implementation (or planned implementation) date of this process (MM/YYYY Format)	582	88%
3	What is the purpose of this process/ what is it designed to do/ what questions does it answer?	632	96%
4	List and describe each type of analysis used by this process (such as historical/retrospective analysis, real-time access, predictive modeling, and statistical analysis).	631	96%
5	List and explain each technology platform that is required (mainframe, windows, server).	631	96%
6	Describe the potential for scalability (for example, can the data analysis process be expanded for additional functional areas, can it be geographically distributed, can it support a larger number of users? Consider administrative, functional, geographic, load, database expandability).	629	95%
7	Have any risk assessments been done? If so what were the results? (future of tools, data availability, hosting, stability of operations, single point of failure, back-up, cross-training, support)	619	94%
Tools and Components			
8	List each type of tool or component used for data analysis; include vendor, version, and any other pertinent information.	625	95%
8a	Provide a description of licensing (including number of licenses and where they were purchased.)	540	82%
9	List the hosting locations and specify what tools/components are associated with each location. (i.e.. Agency(onsite/offsite), ITS, Vendor(name))	571	87%
10	Are these data analysis tools portable to other platforms? Please explain.	610	93%
Data			
11	Describe the subject matter of the data and give examples of major data elements.	628	95%
12	Time period of most of the data: (Day, Month, Quarter, Calendar Year, Fiscal Year, Biennal, Real time, Other)	623	95%
13	Basic unit of data (What is the characteristic of data?) (i.e. Individual, Family, Public Agency, Natural Resource, Cultural Resource, Business, School, Private Agency, Other)	624	95%

Appendix D

Inventory Survey Questions Continued

	Inventory Survey Question	Number of Responses	% Responding Compared to Total Surveys Completed
14	What is/are the main source(s) of the data? (Internal, State, Local, Federal, Public, Business, Other) List agency, vendor, or source name.	626	95%
15	Is the data from this process provided to other entities (State or federal agencies, private sector, general public)? If so, please list, describe how the data is provided, and include dollar amount if fees are assessed for the information.	621	94%
16	If any of your data is purchased, provide the source, licensing information to include license quantities or subscriptions (if applicable), term (such as expiration date), and cost.	612	93%
Governance			
17	How many users have access, by type of user community	397	60%
	Employee	542	82%
	Public	528	80%
	Other	513	78%
18	Provide User Administration requirements (such as security, finger printing, background check, government clearance, HIPPA Compliant, PPI Compliant, IRS 1075 Compliant).	554	84%
19	Select the user administration for this data analysis process (Delegated, Centralized, Other).	560	85%
20	Are any signed disclosure documents required? (Select Yes or No)	559	85%
21	List any rules, regulations, statutes that address requirements to share data.(Include any access rules)	540	82%
Operations/Budget			
22	What percentage of requests come from the following:		
	Executive Management	526	80%
	Middle Management	526	80%
	Staff	524	80%
	Legislative	525	80%
	Public	525	80%
	Other	523	79%
23	What is the total annual cost of operations?	527	80%
24	What is the funding source? (provide budget fund codes where applicable)	504	76%
25	What is the cost of the following:		
25a	Development to Implementation	481	73%
25b	FY 2011-2012 Operations (including all operating expenses)	485	74%
25c	FY 2011-2012 Maintenance Cost (including existing licensing and maintenance)	483	73%
25d	Planned analytical processes or expansion of existing processes (itemize cost by amount and item - hardware, software, hosting, rent, labor, etc	486	74%
26	Please provide any clarifying information to any of the above questions or any additional information deemed applicable.	480	73%

Appendix E

Types of Needed Data

automate network service vendor and customer processes
blood samples data from DWI offenses
businesses - employees, location, etc.
businesses - notification of companies going out of business
businesses/companies/employers in state
businesses - new companies and LCC filings
census data
coordinate city-county-state building permit data
cost analysis of similar functionality
death certificate information
Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT)
economic development projects
educational achievement
electronic SBI lab reports
electronic signature or authentication for e-payments
email list of licensed prescribers and dispensers
employment - employers who receive WIA OJT contract
employment - hiring information
employment - WIA Incumbent Worker Grant recipients
employment - worker compensation data
employment and income records
employment data (quarterly)
energy use data
environmental permit requirements/status for generation and transmission projects
expand BEACON time entry to include ITS project management requirements
federal crime information
financial - CMCS data for capital budgets at the fund/project level
financial - current departmental financial information from state's budget system
financial - info for merged departmental divisions
financial - more timely budget information
financial - procurement data

financial - all accounts receivable so agencies can see what is owed to another agency
fire statistics
fuel analysis data
GIS - framework data for GIS (e.g., tax parcels, streets)
GIS - GPS data for water quality and water use
GIS - land use data
GIS - update of state's Master Address File at CGIA
health claims database, all payers
healthcare licensing information
housing assistance information
income - revenue information on forest products primary processors
income - tax data, federal tax withholding, aggregations by municipality, other
individual - mental health evaluations, electronic notification
individual - arrest records for use in social programs
individual - driver history records
individual - driver licenses, including electronic notification of changes
individual - home address information from tax data
individual - immunization registry data
individual - name change information
individual - school attendance status
individual - shared people database for state
IT - disaster recovery exercises
IT - integrate agency-managed data tapes into ITS system
IT - procurement contract data
land conservation protection plans of other agencies
landing and takeoff data from military bases
link construction project data to NCAS payments
link eCitation with crash report data in GIS
financial - link ITS Service Code to OSC expenditure accounts
link Juvenile Justice data with Jwise
link NCAS data and PPM tool to avoid

Appendix E

Types of Needed Data Continued

separately entering software/hardware costs
link worker information to education data, track outcomes
local jail systems data
local law enforcement interface to court data
local real estate, tax parcels, and tax information
local resolution of waterbody geometry (statewide)
location and status of rare species
market research on business community
marketing automation tools
Medicaid expenditures
NC Rate Bureau information
nonprofit reports, searchable data
occupational accidents from all agencies
performance data for all agencies
prescribed burns and wildfires
private mitigation bank costs, credits types, credit availability, credit service areas
real time access to OITS workload database
SENSOR data relating to chemical exposures
sites for highway or bridge repair
state properties - flood maps and zones for state-owned property
state property - state building projects data
statistics from other states' utility commissions
travel demand data
underground storage tanks permits
vehicle data - registration, miles traveled, speed, etc.
volunteer firefighter pension rolls

Appendix F

Detailed Information on Tools Used for Data Analysis

Microsoft Tool	Count
MS Office Excel	151
MS Office Access	95
Microsoft SQL Server	82
Microsoft Visual Studio 2008 / 2010	15
Microsoft Visual Basic 6	3
Microsoft Net Framework	2
Microsoft ASP.Net	2
Microsoft Red Gate Tools	2
Microsoft ProClarity BI Software	2
Microsoft Dynamics CRM 4.0	1
Microsoft/ UMT Project Portfolio Server 3.2	1
MS Exchange	1
MS Front Page	1
	358

SAS Tool	Count
SAS - Mainframe SAS	31
SAS - Unidentified	10
SAS Business Intelligence Suite 9.2	6
SAS Enterprise Guide	6
SAS 9.13	5
SAS Desktop	4
SAS Query 9 / 9.2 / 9.3	4
SAS - PC SAS	3
SAS - PC SAS/BASE/STAT/ETS/OR 9.3.	3
SAS Base	2
SAS DataFlux	2
SAS Jboss	2
SAS Metadata Server	2
SAS Remote Services	2
SAS - EVAAS for K-12	1
SAS 6.1	1
SAS Data Integration Studio 4.3	1
SAS Data Mining	1
SAS DI Studio 4.2	1
SAS Enterprise BI	1
SAS Fraud Framework	1
SAS IT Chargeback Management	1
SAS IT Resource Manager	1
SAS Strat	1
SAS Support Apps	1
SAS Visualization	1
	94

Appendix F

Detailed Information on Tools Used for Data Analysis Continued

ESRI Tool	Count
ESRO GeoPortal Server	**24**

IBM Tool	Count
IBM's DB2 Spufi SQL	7
IBM Cognos	6
IBM - InfoSpere DataStage	1
Toad for IBM DB2	1
	15

Oracle Tool	Count
Oracle Database Software (Unspecified)	23
Oracle Database Software - 11g	23
Oracle - Apex v4.1	8
Oracle Database Software - 11x	8
Oracle Database 10g	5
Oracle BI Enterprise	4
Oracle Database Software - 11g - APEX 3.1	1
Oracle LMS	1
Oracle Warehouse Builder	1
	74

SAP Tool	Count
SAP Business Objects	25
SAP Crystal Reports	24
SAP - Sybase ASE	7
SAP - Sybase	4
SAP BI	3
SAP - Sybase PowerBuilder	2
SAP Business Warehouse	1
SAP ECC 6.0 EPR	1
SAP - Xcelsius Dashboard	1
	68

Appendix G

Data Subject Matter

Subject of Data	Count
Financial management/analysis, budgeting	71
Education	57
Sites/facilities/state properties	56
Permits, licenses, registrations, and Certifications	54
Personal identity information, verification	54
Natural resources, waste management, Air/water quality	52
Rules, regulations, regulatory inspections, Penalties	52
Customer/client survey/complaints Claims/help desk	50
Case management	44
Billing, invoicing, purchasing, vendors	36
Contract/grant processing or management	34
Planning and program evaluation	34
Businesses	33
Equipment and services	26
Laboratory testing and technical analyses	25
Project tracking	25
News service, press releases, events	24
Human resources/payroll	21
Employment/unemployment, jobs, wages	17
Agriculture	11
Taxes	9
Filings and dispositions	7
Land parcels/GIS data layers	7
Safety and risk assessment and prevention	7
Housing programs	3
Information technology processes	3
Energy	2
Tourism and trade	2

Appendix H

Unit of Data

Unit of Data	Count
Individual	126
Business	47
Accounting and Budgeting	42
Case, claim, contract	27
Public Agency	27
Document or report	19
State agency	18
School	17
Local agency	16
Natural Resource	14
Private Agency	14
Course of instruction	8
Facility	8
Program, project, purpose, or issue	8
Family	6
Household	6
Vehicle	6
Geographic location	5
College or university	4
Employer	4
Equipment	4
Cultural resource	3
Event	3
Utilities	3
Web site	3
Animal	2
Board or commission	2
Building	2
Energy resource	2
Evidence item	2
Federal government	2
Land asset	2
Other	2
Roadway	2
Aircraft	1
Emissions	1
Non Profit Agency	1
Park	1
Trade data	1
Travel resource	1
Water system	1

Appendix I

Time Period

Time Period of Data	Count
Daily	155
Monthly	152
Real time	150
Calendar year	85
State fiscal year	70
Quarterly	67
Other	30
Custom defined dates and/or ranges	29
Weekly	18
As available or as needed	13
Academic term, academic year	12
Varies	10
Biennial	8
Semi-annual	5
15 minutes	4
Federal fiscal Year	4
Cumulative over time	3
Near real time	3
Year-to-date	3
every 5 years	2
Hourly	2
Bi-weekly	1
Decade	1
Seasonal	1

Appendix J: CJLEADS Return on Investment Analysis

ROI Source									FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016
	Actual															
	Total Active Users (as of June 2012)	Actual Number of Records Accessed (FY 11-12)	Annual Records Accessed Based on May 2012 Usage	Annual Records Accessed *(Estimated Usage Based on 10% Growth)*	Research Time Saved per Record Accessed (minutes)	Hours Saved (FY 11-12)	Annual Hours Saved (Projected Years)	Hourly Rate								
Improved Efficiency and Automation																
Judicial Staff																
Judicial	171	6,584	12,168	13,385	10	1,097	2,231	$30			$ 15,840	$ 32,920	$ 66,924	$ 66,924	$ 66,924	$ 66,924
Clerks	532	19,602	32,940	36,234	10	3,267	6,039	$30			$ 44,790	$ 98,010	$ 181,170	$ 181,170	$ 181,170	$ 181,170
Magistrates	358	35,059	49,788	54,767	10	5,843	9,128	$30			$ 100,800	$ 175,295	$ 273,834	$ 273,834	$ 273,834	$ 273,834
Prosecutors	681	72,961	120,264	132,290	10	12,160	22,048	$30			$ 114,570	$ 364,805	$ 661,452	$ 661,452	$ 661,452	$ 661,452
Sub Total	**1,742**	**134,206**	**215,160**	**236,676**		**22,368**	**39,446**				**$ 276,000**	**$ 671,030**	**$ 1,183,380**	**$ 1,183,380**	**$ 1,183,380**	**$ 1,183,380**
Law Enforcement Staff																
Law Enforcement	16223	4,777,599	6,592,896	7,252,186	5	398,133	604,349	$25			$ 1,777,435	$ 9,953,331	$ 15,108,720	$ 15,108,720	$ 15,108,720	$ 15,108,720
Law Enforcement Support	1315	122,938	172,296	189,526	5	10,245	15,794	$20			$ 24,765	$ 204,897	$ 315,876	$ 315,876	$ 315,876	$ 315,876
Sub Total	**17,538**	**4,900,537**	**6,765,192**	**7,441,711**		**408,378**	**620,143**				**$ 1,802,200**	**$ 10,158,228**	**$ 15,424,596**	**$ 15,424,596**	**$ 15,424,596**	**$ 15,424,596**
Corrections Staff																
Probation	2306	272,298	358,776	394,654	5	22,692	32,888	$20			$ 6,378	$ 453,830	$ 657,756	$ 657,756	$ 657,756	$ 657,756
Prison Intake & Support	64	1,177	1,177	1,295	5	98	108	$20			$ 892	$ 1,962	$ 2,158	$ 2,158	$ 2,158	$ 2,158
Sub Total	**2,370**	**273,475**	**359,953**	**395,948**		**22,790**	**32,996**				**$ 7,270**	**$ 455,792**	**$ 659,914**	**$ 659,914**	**$ 659,914**	**$ 659,914**
Juvenile Justice Staff																
Court Counselors	25	2,640	2,640	2,904	5	220	242	$20			$ 4,533	$ 4,400	$ 4,840	$ 4,840	$ 4,840	$ 4,840
Improved Efficiency & Automation Sub-total	**21,675**	**5,310,858**	**7,342,945**	**8,077,240**		**453,755**	**692,826**				**2,090,004**	**11,289,450**	**17,272,730**	**17,272,730**	**17,272,730**	**17,272,730**
Improved Safety - Cost Avoidance																
				Number of Potential Lives Saved Annually			**Value of a Life**	**Total Value**								
Post Pilot - Save four lives with integration of offender information				4			$ 1,125,000	$ 4,500,000			$ 2,250,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000
Total Improved Efficiency and Automation and Improved Safety											**$ 4,340,004**	**$ 15,789,450**	**$ 21,772,730**	**$ 21,772,730**	**$ 21,772,730**	**$ 21,772,730**

Development Cost							
ANNUAL							
Actual Development Costs	$ 2,128,091	$ 7,643,027	$ 7,876,469	$ 7,876,469			
Estimated Development Costs					$ 7,705,737	$ 7,996,377	$ 7,996,377	$ 7,996,377
Total Costs	**$ 2,128,091**	**$ 7,643,027**	**$ 7,876,469**	**$ 7,876,469**	**$ 7,705,737**	**$ 7,996,377**	**$ 8,016,377**	**$ 8,016,377**
Estimated Implementation Savings			**$ 4,340,004**	**$ 15,789,450**	**$ 21,772,730**	**$ 21,772,730**	**$ 21,772,730**	**$ 21,772,730**
CUMULATIVE							
Total Costs	**$ 2,128,091**	**$ 9,771,118**	**$ 17,647,587**	**$ 25,524,056**	**$ 33,229,793**	**$ 41,226,170**	**$ 49,242,547**	**$ 57,258,924**
Estimated Implementation Savings			**$ 4,340,004**	**$ 20,129,453**	**$ 41,902,183**	**$ 63,674,913**	**$ 85,447,643**	**$ 107,220,373**
Return			**$ (13,307,583.25)**	**$ (5,394,602.67)**	**$ 8,672,390.17**	**$ 22,448,743.00**	**$ 36,205,095.83**	**$ 49,961,448.67**

Improved Efficiency and Automation	Efficiency savings for law enforcement is based on the actual number of DMV and offender queries during the month of May, 2012, with a 10% growth in FY 2013. Conservatively, if each inquiry saves a law enforcement officer has 5 minutes of research time,
	Courts personnel have indicated that they are saving 33% of the resource time required to research information, approximately 10 minutes per investigation. Savings associated with courts usage is based on the actual number of DMV and offender queries run
Improved Safety	The cost of a human life is estimated at 1.125 million. Computation of Human Life value requires a detailed analysis of many factors.
	For simplicity if an individual is murdered at 35 and has 30 years of future income of which 75% is spent on his/her family then the value of the life would equal (30*(50,000*.75)) The value of a human life would equal 1,125,000

Return on Investment

Return on investment is found as intangible benefits of improved efficiency, better informed decision making, and improved safety for law enforcement and the public. The ability to access integrated statewide information in a single web-based application allows the courts and law enforcement to save valuable time researching information and focus their efforts on more important public safety specific job responsibilities. These benefits do not provide monetary budget savings, but do permit criminal justice professionals to be more effective and efficient.

Intangible benefits for FY 2011-2012, based on actual usage of the application, are approximately $15.8 million. Leveraging the average usage statistics based on the trained CJLEADS user population in May, 2012 with a 10% growth in FY 2013, estimated annual benefits of CJLEADS are approximately $21.7 million. These projected intangible benefits, based upon FY 2010–2011 current usage, include:

- CJLEADS will provide a more efficient method for offender searches providing a wider and more inclusive base of information through a single search process. Efficiency savings for law enforcement assumes a 10 percent growth to full capacity. Conservatively, if each inquiry saves a law enforcement officer five minutes of research time, the estimated saving are $15.4 million annually.

  This does not represent a reduction in workforce, but improved efficiency as well as improved information and decision making by law enforcement officers. For example, if a law enforcement officer can more quickly access and review information about individuals involved in a motor vehicle accident, he will be able to return to managing traffic flow, resolving the incident and resume normal patrol activities in a timely manner.

- Wake County Clerk of Court personnel indicated that they are saving 33% of the resource time required to research information, approximately 10 minutes per investigation. Savings associated with actual courts usage in FY 2011-2012 are approximately $671,000. Assuming an expected 10 percent growth in courts users, and that each inquiry saves 10 minutes of research time, the estimated savings are $1.18 million annually. This efficiency should allow court personnel to complete research in less time, helping them better manage the ever-increasing court system case load resulting in better administration of justice and service for the State's citizens.

- Other CJLEADS users, including probation and parole officers, prison intake officers and juvenile court counselors, are estimated to save an average of five minutes for each offender or DMV record accessed. Based on expected growth of 10% for corrections and juvenile justice staff, the estimated annual savings are $659,000. This will allow probation and parole officers, prison intake officers, and juvenile court counselors to quickly access information about offenders under their supervision and to better focus their efforts on interaction and supervision activities.

- Similar to an appraisal of the value of life in court cases, based upon life span and earning potential, an average actuarial estimate of the value of a life saved is stated at $1.125 million. If the use of CJLEADS when fully deployed statewide saves four lives annually, the benefit to the State would be $4.5 million per year.

  Comparing these intangible benefits to project costs, the return on investment analysis, based on just the largest North Carolina counties, CJLEADS yields a project break-even point of four years, or during the second full year of operations.